EDUCATING SPASTIC CHILDREN

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THE EDUCATION AND GUIDANCE OF THE CEREBRAL PALSIED

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OLIVER AND BOYD
EDINBURGH: TWEEDDALE COURT
LONDON: 39A WELBECK STREET, W.1.

First published 1956
Second impression 1957

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PREFACE

THIS book has something of an international family flavour as it owes its origin to work and experience in five English-speaking countries over the past ten years.

It is essentially an English product based mainly on research work done at the University of Birmingham Medical School in the Department of Child Health and Paediatrics and in the Carlson House School and Centre for Spastics in Birmingham. But its fashioning owes something also to time spent so profitably and pleasantly in spastic centres in U.S.A., Canada and New Zealand. Then it was expanded, polished and completed as a result of work in the Queensland Spastic Children's Centre and in close contact with spastic centres in the other Australian capital cities, which have in the past five years witnessed a phenomenal growth in medical and educational provision for children with cerebral palsy.

The main purpose of the book has been to provide first-hand information of an educational and psychological kind for all concerned with the education, upbringing and general welfare of the cerebral palsied. Inasmuch as the book is based on experience and experiments in clinic and classroom and on work with spastic children in all kinds of environments—home, hospital and school—it has both a sustained scientific basis and a strong practical flavour. For, while on the one hand I was concerned with problems such as the incidence of cerebral palsy, the assessment of intellectual levels and educational possibilities of spastic children, and the observation of their psychological characteristics, yet at the same time I was constantly aware of the importance of parent and home, and so I have written, in a sense, as much for the parent as for the specialist, be he administrator, psychologist, teacher or therapist.

Although I have aimed at presenting the more scientific material with a minimum of statistical data, it may well be that some readers might wish to omit Chapters V, VI and VII as being rather technical. Yet on topics such as the intelligence of spastic children, with which these chapters are concerned, it is important that as many people as possible should be reasonably well informed. For without knowledge of an objective kind there is always the possibility that unsubstantiated opinion or sentimental approach may incorrectly influence attitudes and policies in regard to handicapped children. For example, until recently a wide range of incorrect beliefs about the intelligence, or lack of intelligence, of cerebral palsied children made work in the field more difficult.

First-hand information on the learning capacities of cerebral palsied children from the present research, based on English and Australian groups, revealed that while there are, contrary to some opinion, many intelligent spastics who have a right to normal education (primary and secondary) through special facilities, whatever the cost, there is also a large proportion who are mentally retarded, who can never reach normal educational objectives. Our research results (confirmed in American investigations) reveal that, out of every 100 cerebral palsied children, approximately 24 are of normal or above normal intellectual power, 27 are dull or slow-learning and 45 are mentally retarded (22 extremely mentally defective). The remaining 4 are so badly handicapped that diagnosis is not possible. This finding has been adequately tested through the educational opportunities offered to all grades of children over a number of years.

Throughout the book, although extensive reference is made to information obtained from the application of individual intelligence tests to the pupils studied, these results have been only part of very full case studies which included details of each pupil's background of experience and personality generally. The more recent conception of an intelligence test result as a composite, derived from innate intellectual power and from opportunity of home and school, has special significance in regard to handicapped children. In fact the contention of D. O. Hebb (*The Organisation of Behaviour*) and J. Piaget (*The Psychology of Intelligence*) that, in a much greater measure than has hitherto been realised, the nature and level of an individual's intellectual powers are fashioned by early habits, early forms of imitative thinking, early opportunities for certain experiences, is nowhere more strongly borne out than in this study of cerebral palsied children. Early deprivation of experiences through continued hospitalisation, through gross sensory handicaps, through inability to walk, or through isolation and over-sheltering by misguided parents, sometimes produced patterns of intellectual response that at one time would have been ascribed to innate limitations.

As I have shown continuously throughout this account of my work, allowance must be made for these differences in children's backgrounds in estimating their potential for intellectual development and possible benefit from special education. Thus, although Jill, an attractive little athetoid of 5¾ years spoke in whispered monosyllables and could only hold test material with the greatest difficulty, yet the movements of her eyes and her head yielded evidence of correct responses to items indicative of high intelligence. Tony, aged 9 years, who had spent so long in hospital and in an over-protective home that he had no knowledge of many common objects, activities and experiences and who in consequence could not frame many common relationships, showed remarkable 'intellectual' growth in a school which provided him with these experiences. Again, Mary, depressed to the point of despair and dullness through the insecurity and barrenness of a regimented residential school, increased her score on the intelligence test by over twenty-five points when brought home to attend daily a school that provided maximal intellectual stimulus.

And thus, in addition to specific information on spastic children, the whole study has yielded some information of general interest to psychologists and educators not only in regard to the nature of the child's mind, but in the broader fields of parent counselling and mental health.

In assessing the pattern of the cerebral palsied, their treatment and their education, it should be realised that the great bulk of the progress made has been a product of the past ten years. Much more research is yet required to solve more problems; but at least we have made an inspiring start in these ten years, a start that has already dispelled fear and frustration from the lives of thousands of children and their parents.

As I have indicated earlier, this book owes much to many people who have helped in many ways with their advice, their knowledge and their services.

I should like to thank Professor J. Smellie, O.B.E. of the Department of Child Health and Paediatrics in the University of Birmingham for the opportunity to participate in the first clinical survey of cerebral palsied children undertaken in Great Britain and for his help and understanding throughout the work. To my co-worker in the survey, Dr Patria Asher, I am most grateful for the stimulus and pleasure derived from our constant conferences together in diagnostic clinics throughout the Midland counties of England.

To Dr W. D. Wall of the Education Department of the University (now Educational Consultant to U.N.E.S.C.O.) I am more than grateful for constant help with educational and psychological aspects of my Birmingham research.

But much of my experimental work and my opportunity to study cerebral palsied children was made possible by Mr Paul Cadbury, C.B.E., who generously financed the establishment of the Carlson House School for Spastic Children and who has since continued by his ever-ready encouragement and help to foster the study of the needs of spastic children.

To Mrs Brown and her staff I owe a special debt for their generous co-operation and continued interest during my association with the Carlson House School for Spastic Children.

In New York I was fortunate to have the advice of those two great American pioneers in the field of cerebral palsy, Dr Winthrop Phelps and Dr Earl Carlson to whom the cause of the spastic child owes so much.

In Australia I have found cause to be continuously grateful to the staffs of the various Spastic Centres and particularly so to Dr Burton Bradley and Mr and Mrs McLeod of the Spastic Centre, Mosman, Sydney, to Dame Jean Macnamara of the Children's Hospital Spastic Centre, Melbourne, and to Dr Harold Crawford of the Queensland Spastic Centre, Brisbane, for the many occasions on which we have discussed a wide range of problems connected with cerebral palsied children and their parents. I should also like to thank Dr Burton Bradley and Dr Harold Crawford for reading the section on the Nature of Cerebral Palsy.

Above all I am sensitive of the great help I have derived from administrators, doctors, school staffs and university colleagues in the course of my work with spastic children. It is also with humility that I recall the many profitable hours I have spent with hundreds of spastic children whose co-operation, patience and gratitude have at all times been an inspiration to me and made my work so satisfying.

Finally, I wish to thank my husband for his constant help with discussions and suggestions for my research and for his assistance in the preparation of the material for publication.

F.E.S.

BRISBANE
February 1956

ACKNOWLEDGEMENTS

I SHOULD like to thank the following for permission to make certain reproductions.

Dr Patria Asher for the two tables of incidence from our joint report in the Archives of Disease in Childhood; The Midland Spastic Association for the Cerebral Palsy Record Booklet used for our diagnostic survey; Mrs Brown for the Record Booklet used with children at the Spastic School, for the children's newspaper, *The Carlson House Clarion*, and for photos of pupils at the school; Mrs McLeod for the photo of the Spastic Centre, Mosman, Sydney; Mr G. K. D. Murphy, Director of Primary Education in the Department of Public Instruction, Queensland, for photos taken at the Spastic School, Brisbane.

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PART ONE:
THE PROBLEM

CHAPTER I

INTRODUCTION

THE past decade has seen greatly increased attention paid to the problem of the spastic and his particular form of handicap, and nowadays in almost any gathering of people few terms can be more certain of arousing attention and interest than the word *spastic*. Immediately someone asks a question, which may range from that of the merely curious person who wants to know the meaning of this word 'spastic', to that of the vitally interested relative, teacher or friend of some spastic child or adult, seeking advice on the best method of treatment for his particular case.

'Why', one may ask, 'have people suddenly become so interested in spastics? Is spasticity some new kind of disease or infirmity? Is it inherited? What relation does it bear to infantile paralysis?' These and similar queries are frequent.

Many people tend to use the term 'spastic' when referring to all individuals suffering from cerebral palsy, whereas actually the spastic group is one of several in the cerebral palsy category. The present study is concerned with the whole group of cerebral palsy cases. The clinical connotation of the term 'cerebral palsy' implies muscular disorder which is due to faulty development of or damage to the brain occurring before, during or after birth. As a consequence of this brain lesion the child has difficulty in sitting, walking, talking, using the hands or balancing the head and body.

For many years doctors, and particularly specialists, have been aware of these conditions and have treated many of the cases with extreme skill. Some individuals who had been considered hopeless cripples have been enabled to walk tolerably well, while many, by means of physiotherapy, have gained control over hands and legs. But until recently only a small proportion of cerebral palsy cases were considered worth spending time on educationally. The general attitude towards cerebral palsied children with severe disabilities, especially those afflicted with athetosis, was that the bulk of them were mentally defective and would not justify time and energy spent on trying to educate them. This explains the lack until recently of provision for such children in Britain and abroad. The less disabled were treated at hospital while attending the ordinary school; some, whose physical disabilities were too severe to allow them to attend the ordinary school, were in certain areas accommodated in schools for physically handicapped children; the remainder were either kept at home, mostly without tuition of any kind, or on occasion put into an institution for mentally defective children.

The greatest shock to the complacency of doctors and educationists was given by Dr Earl Carlson, an American, who, born with an extremely severe degree of cerebral palsy and regarded by many as an incurable cripple, yet contrived to overcome his physical disabilities sufficiently to enable him not only to attend high school and university but also to qualify as a doctor and specialist in the treatment of cerebral palsy. Yet, as he shows us in his book *Born that Way*,[1] had it not been for the faith and determination of his mother, together with his own strength of will, he might have become one of those chair-ridden invalids whose limited horizon would have stultified his mental development, even if he had escaped the stigma of mental defect which has been attached to others similarly afflicted.

Hearing Dr Carlson's story, with all its implications for the future of cerebral palsy victims, people in other parts of the world also began to ask, 'What are *we* doing about this problem'?

In Great Britain the answer was depressing, for it revealed that no attempt had been made to estimate the incidence of cerebral palsy on the basis of reliable diagnosis; nor was there any evidence of the distribution of intelligence among cerebral palsied children. Furthermore, educationists and psychologists had little guidance concerning the educability of these children.

The greater part of this book is concerned with the results of research undertaken to answer these and allied problems, such as the type of special educational provision required for these children, the special curricula and equipment found most useful in the practical application of general principles, suggestions for parents and teachers in the psychological approach to the whole problem of cerebral palsy as it affects them and their children, and, finally, the welfare and future of cerebral palsied adolescents and adults.

---

[1] Earl R. Carlson, *Born that Way* (The John Day Co, New York, 1941)

CHAPTER II

NATURE OF CEREBRAL PALSY

IN the study of cerebral palsied children it is essential to consider their physical condition as this has an all important bearing on their psychological and educational development. For this reason a very brief consideration of cerebral palsy types and their accompanying manifestations is given in the following pages.

DEFINITION AND AETIOLOGY[1]

Cerebral palsy is the term used to designate certain types of motor disability in which the impairment or loss of muscular control is due to a lesion of the brain caused by injury to or faulty development of the growing brain tissues.

The possible causes of cerebral palsy are numerous but, generally speaking, anything that produces defective development of or injury to the motor-areas of the brain can cause cerebral palsy.

The brain lesion may occur before, during or after birth and the extent of the damage is indicated by the severity and extent of the physical and mental handicap.

The causes may be described under three headings. *Before birth* there may be disease or injury of the mother, mal-development of the brain, hereditary or genetic conditions, intra-cranial haemorrhage of the foetus, incompatibility of the baby's and mother's bloods (Rh. factor). *At birth* there are two main causes (i) lack of oxygen to the central nervous system—anoxaemia. This can be due to many causes, but is essentially associated with some interference with the circulatory or respiratory systems of the child. Pressure on the umbilical cord, prematurity or non-expansion of the lungs are important factors in causation. (ii) injury to the brain; obstructed labour, precipitate birth, trauma due to instrumental delivery—all of these may cause localised or generalised haemorrhage and consequently cerebral palsy. *After birth* there may be infection such as meningitis or encephalitis and accidents resulting in head injuries.

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[1] Professional workers requiring a much more detailed consideration of the nature and aetiology of cerebral palsy than could be given here (where it would in fact be out of place for the purpose of this book) are referred to A Survey of 400 Cases of Cerebral Palsy in Childhood by Patria Asher and F. Eleanor Schonell, *Archives of Disease in Childhood*, Vol. 25, No. 124, December 1950.

CLASSIFICATION

Different parts of the brain have specific functions in the control and organisation of movement and hence the actual site of the cerebral lesion determines the type of disability produced. The main types of cerebral palsy are those associated with *spastic paralysis*, *athetosis*, *ataxia*, *tremor*, *rigidity and flaccidity*. The first two, spastic paralysis and athetosis, comprise the great bulk of cerebral palsied children.

Spastic Paralysis[1]

Certain areas of the cerebral cortex are concerned with the control of voluntary or willed movements. They suppress abnormal or excessive stimulation and are thus called suppressor areas. Damage to or destruction of these areas causes a state of spasticity in certain muscles. For a movement to occur around a joint a stimulus must be received by opponent muscles to relax at the same time as a stimulus to contract is received by the working muscles. Due to the loss of the suppressor control this does not occur in spastic paralysis; rather there is an overflow of stimulation to the antagonists and reflex spasm occurs—stretch reflex. The muscles affected are in a state of spasm and thus shortened. They cannot be reciprocally elongated by their opponents and thus they become adaptively shortened with resulting deformity of the part.

Due to the dysfunction of muscle control certain primitive reflexes necessary in development, such as holding up the head, sitting up, standing etc. do not develop or are retarded.

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[1] In poliomyelitis (infantile paralysis)—not to be associated in any way with cerebral palsy—the spinal cord is affected, with resulting flaccid paralysis.

Groups of muscles affected by paralysis vary, but usually there is a well-marked clinical picture. In the lower limbs the adductors and medial rotators of the hips produce adduction and medial rotation: hamstrings cause flexion deformities of the knees, and the calf muscles equinus position of the feet. In the upper limbs the muscles usually affected are the adductors of the shoulders, flexors of the elbows, pronators of the forearms, flexors of the wrist and fingers, adductors of the thumbs; paralysis of these groups produces characteristic deformities.

In some cases sight, speech and/or hearing are affected.

Spasticity may affect one or more limbs or parts of the body and cases are classified into groups according to the physical manifestations of dysfunction. These are given below.

Monoplegia signifies that only one limb is spastic in either slight or severe degree. Sometimes the handicap is so slight that it is almost or quite overlooked by teachers and others. On occasion, such cases have not been diagnosed as cerebral palsy, either because parents have not troubled to report the case, or because it has not been recognised as cerebral palsy as the child is normally intelligent, some medical practitioners still being under the impression that all spastics are of low mentality.

Hemiplegia implies that one side of the body is affected. Sometimes only one upper and one lower limb are involved in a similar or varying degree; sometimes the damage is more extensive and the side of the face may be affected. Hemiplegias are amongst the most easily recognised cases of cerebral palsy.

Triplegia. When any three specified limbs are involved, *e.g.* two legs and one arm, the term 'triplegia' is used. Monoplegia and triplegia are less common than the other types.

Paraplegia is the term denoting disability of both legs. Occasionally non-spastic cases were referred to our Cerebral Palsy Clinic[1] when the superficial physical manifestations were similar to those of cerebral palsy. After more detailed examination, however, the true diagnosis was apparent.

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[1] At the Children's Hospital, Birmingham University Department of Paediatrics and Child Health

Quadriplegia. This term is used to describe cases where there is involvement of all four limbs, and often the head and trunk as well. The terms 'diplegia' and 'tetraplegia' are sometimes used in this connection, but in this study we have adhered to the more generally accepted terms of classification, as given above. As a rule the most severe cases of cerebral palsy are found in this group. The arms may be adducted and medially rotated; the elbows are flexed and wrists either dorsiflexed with fingers flexed or more often volar flexed with fingers extended; the hips and knees are flexed while the thighs are adducted and the ankles plantar-flexed. When the child tries to stand his toes touch the ground but the heels remain raised, and when he attempts to walk he exhibits the characteristic scissor gait, the legs crossing over and so being unable to bear his weight. Not all spastics whose legs are affected have the scissor gait but many find it difficult to put the heel to the ground, and if they are allowed to walk thus the foot tends to become everted.

Many of the children with paraplegia or quadriplegia are unable to walk alone, while some of the most severe cases are confined to their chairs.

In a proportion of the cases classified in the above groups we find, superimposed on the afflictions already detailed, the additional handicap of sensory defects or spasticity of the tongue and muscles of speech. Cases sometimes occur where such defects have not been recognised and in some children there is the possibility of attributing a lower level of intelligence to them than is really correct. For example, where high frequency deafness has not been diagnosed the child may owe his backwardness or his lack of response not to his low level of intelligence but to the fact that he does not hear certain notes in the complete range of the human voice.

In a large proportion of the cases with which I have come in contact during my research, particularly among older children, the original handicap of spasticity has been greatly increased by malformation of the limbs due to the fact that, owing to lack of proper treatment, the spastic muscles have been allowed to exert their unequal pull and various postural defects have added to the misfortunes of the cerebral palsied child.

Athetosis

Whereas spastic paralysis is due to an injury to the cerebral cortex or pyramidal tract producing inability to perform normal *voluntary* movements, *athetosis is probably caused mainly by damage to the basal ganglia which control involuntary movements.*

The athetoid wishing to put his hand to his mouth may do so, but while the movement is being carried out a variety of involuntary, jerky movements may occur which cause the act to be awkward, and often cause it to lose direction completely. Hence, instead of putting his hand to his mouth he is just as likely to give a sharp smack to his own or his neighbour's eye.

With the athetoid there are during sleep or relaxation no abnormal manifestations, but with voluntary movement—or even the thought of it—or with the stirring of emotional impulses, the whole body may become a mass of jerky involuntary movements which, to the inexperienced eye of the uninitiated, present the unfortunate child as a sorry spectacle. The squirming athetoid gestures, together with the facial grimaces that often characterise the condition, being merely the result of involuntary movements of the facial muscles, have in the past given rise to the not unnatural assumption that the patient is feeble-minded if not actually an imbecile. This is particularly so when to these basic handicaps is added complete or partial lack of speech, as is often the case with this type of cerebral palsied child. Yet many workers in this field now suggest that pure athetoids are not of low mentality except where the mental defect is caused by some quite independent factor such as inherent defect or separate lesion in the brain.

There are three[1] well-known main types of athetoid: the tension athetoid, the non-tension athetoid and the choreiform type.

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[1] Dr Phelps now lists twelve types of athetoid, each distinguished by some special characteristic. These are tension, non-tension, neck and arm, deaf, hemi-athetoid, distonic, flail, rotary, tremor, shudder, cerebellar release and emotional release. (Personal communication, Baltimore, U.S.A.)

The *non-tension athetoid* is characterised by the uncontrollable, repetitive movements described above.

According to some authorities the *tension athetoid* originally had all the free, involuntary movements of non-tension athetosis but early in life he endeavoured to prevent these undesirable and frustrating movements by tensing his muscles against the involuntary reactions. In so doing, he overcame to some extent the gross athetoid movements, but in their place there appeared a tension of the muscles closely resembling that of the spastic. It is for this reason that tension athetoids are sometimes classified as spastics. When such children are involuntarily relaxed, as when going under or coming out of an anaesthetic, free athetoid movements occur. 'All babies show purposeless movements in the first four months and, therefore, the athetoid type of cerebral palsy is not diagnosable until willed movement begins to appear somewhere between the fifth and eighth month after birth.'[1]

Ataxia

The ataxic group of cerebral palsy cases is considerably smaller than either of the two groups already discussed. This disability is due to upset of the postural control of the muscles by the cerebellum statically and in movement. The child is unsteady and shows inco-ordination in movements. This is shown in carrying out a willed action with the upper or lower limbs. It may be classified as an intention tremor. Sometimes the articulation is affected with resulting hesitation and slurring in speech. Fixation of the eyes may be impaired and this increases the difficulty in learning to read. Inco-ordination in function of the eyes may cause nausea.

Tremor and Rigidity

The tremor and rigidity types of cerebral palsy account for a small percentage of the cases. The *tremor* type is characterised by involuntary vibrating movements, usually of a regular nature. These may occur when willed movement is attempted

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[1] Eirene Collis, *A Way of Life for the Handicapped Child* (Faber and Faber Ltd, London, p. 31)

(in the tension type) or may be constant (in the non-tension type).

Rigidity is associated with interference with postural tone. The rigidity varies considerably in degree. In contrast to the tension in spasticity the resistance is even and has been described as 'lead pipe rigidity'. These cases are not common.

EARLY HISTORY OF THE CEREBRAL PALSIED CHILD

The usual history of the cerebral palsied child is one of protracted labour or difficult birth, premature or precipitate birth, asphyxia and/or cerebral haemorrhage, a severely jaundiced baby or a blue or white shocked baby.[1] Sometimes the baby is very sick or does not suck normally.

After the passage of a few weeks the baby usually settles down and appears to progress normally. Generally the first thing that suggests there is something amiss is the fact that the baby does not sit up at the normal time. When he reaches the age of about twelve months and still shows no signs of sitting up the parents begin to enquire whether all is well. In the past such parents have been assured, all too frequently, that the baby is lazy or late in developing and that he will be quite all right later on.

The parents begin to think their child is just a little backward. Then as the weeks pass and he fails to achieve the standards of even backward children in muscle control—normal balance, arm and leg movements and speech—they become anxious and seek advice anew.

It is in the second or third year of life that the majority of cerebral palsied children are first brought to the notice of the medical profession, although the condition has probably been there from birth. All too frequently, however, in the past the child has not been seen by any competent authority until a much later age, for parents often wonder whether the child is mentally, as well as physically, deficient and so may think that little can be done to improve his condition.

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[1] In our survey of 349 cases of congenital cerebral palsy examined by Dr Asher 211 cases had a history of premature or difficult birth.

CHAPTER III

HISTORICAL BACKGROUND[1]

In this very brief historical survey I have considered developments in three countries, America, Australia and Great Britain, as illustrative of the pioneer efforts and of the increasing organisation which is slowly coming into being to deal with this problem on a national basis in each country.

THE STUDY OF CEREBRAL PALSY IN AMERICA

In the pioneer work done in America for sufferers from cerebral palsy two names stand out—those of Winthrop Phelps and Earl Carlson. Each of these medical practitioners approached the subject from his own special standpoint and hence two complementary aspects of treatment have been developed. Phelps is essentially interested in the medical aspects of the problem, particularly in physiotherapy and the use of braces, and so he sought for a solution to the cerebral palsy problem through a careful diagnosis of each individual case, to be followed by physiotherapy of an intensive, specialised kind. In his treatment stress is laid very largely on the physical aspect, although he advises psychological and educational guidance when necessary.

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[1] As interest in the educability of the cerebral palsied child is of comparatively recent origin there is a paucity of literature on the subject. The only available published books reporting a scientific approach to the problem are those of Lord, Strauss and Lehtinen, Doll, Phelps and Melcher, and Gesell and Amatruda; the last three mentioned deal with certain aspects of cerebral palsy as part of a wider field. Since the completion of this research Dunsdon's work has also been published.

See: Lord, Elizabeth Evans. *Children Handicapped by Cerebral Palsy* (New York, The Commonwealth Fund: London, Oxford University Press, 1937)

Strauss, Alfred A., and Lehtinen, Laura E. *Psychopathology and Education of the Brain-injured Child* (Grune and Stratton, New York, 1947)

Doll, E., Phelps, W. M., and Melcher, R. T. *Mental Deficiency due to Birth Injuries* (The Macmillan Co, New York, 1932)

Gesell, Arnold, and Amatruda, Catherine S. *Developmental Diagnosis. Normal and Abnormal Child Development* (Hamish Hamilton Medical Books, London, 1947)

Dunsdon, M. I. *The Educability of Cerebral Palsied Children* (Newnes Educational Publishing Co Ltd, London, 1951)

Carlson's approach to the problem is somewhat different. Himself a sufferer from cerebral palsy since birth, he has intimate knowledge and experience of the cerebral palsied child, and as a result he recommends a study of the child as a whole. From his own experience, as well as from his observations of many clinical cases, he has become convinced that while every care should be given to the physiotherapy aspect of treatment, this should go hand in hand with an understanding development of the psychological life of the child. He says, 'I am eternally grateful to those doctors who urged my mother to concentrate on my mental development rather than on a physical cure which they deemed impossible'.[1]

'The conventional orthopaedic view was that improving the physical difficulties would bring about a better psychological attitude, but I felt that the way to better physical control lay in control of the emotions. Whenever I received congratulations for showing physical improvement, I could always find an explanation in some incident which had increased my self-esteem.'[2]

To Phelps and Carlson we owe an immense debt, for by their efforts they have made us aware of the injustice being done to numbers of children afflicted with cerebral palsy.

In 1862 Little had described a drooling, speechless, cross-legged child with very low mentality as afflicted with Little's Disease. He referred to the condition as spastic paralysis and thenceforth the two terms became synonymous. During an epidemic of poliomyelitis in 1920 many children brought as possible victims were diagnosed as cerebral palsy cases; nothing was done for them because doctors accepted the attitude of Little that cerebral palsy cases were probably of low-grade mentality and little or nothing could be done to improve their condition.

This attitude was general throughout the world. Slight, and sometimes severe, physical handicaps were treated by orthopaedic surgeons by the same methods as those used for other orthopaedic cases, but little effort was made to make a special study of the causes and treatment of cerebral palsy.

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[1] Carlson, *Born that Way*, p. 19

[2] Ibid., p. 70

Even after Phelps and Carlson had proved that many cerebral palsied children of normal intelligence were receiving no education and little physical treatment, they still had a long and difficult task to persuade others that these children were worth educating and treating medically. Finally, it was only by the efforts of a very few individuals, some of whom were parents of cerebral palsied children, that a new approach to the problem was developed and special clinics and schools for cerebral palsied children were established.

Although by 1945 considerable interest had been aroused in cerebral palsy, Jennings[1] tells us that there were only forty public institutions (including homes for the feeble-minded) that would care for spastics, but none of these treated cerebral palsy cases exclusively. There were only three private schools which catered specifically and solely for such children, and of these two were the boarding *School of Earl Carlson* at East Hampton, Long Island, and the *Children's Rehabilitation Centre* (boarding establishment) at Cockeysville, near Baltimore, under the direction of Winthrop Phelps.

In September 1944 the Michael Reese Hospital in Chicago opened a day nursery whose medical director, Meyer Perlstein, realised that if these handicapped children were to be helped the most effective way was to start therapy and training while they were still very young and before too many wrong muscle habits had become established.

The pattern of development of special education for cerebral palsied children has in the main followed the lines set in these initial ventures, that is, provision of privately owned schools exclusively for cerebral palsied children, schools attached to hospitals which have cerebral palsy clinics, schools for physically handicapped children which may or may not have special teaching for the cerebral palsied, and, more recently, state-aided nursery[2] and elementary schools or classes. While the nursery

[1] Dana C. Jennings, What Can be Done for the Spastic Child? *Hygeia* (Health Magazine of the American Medical Association), November 1945

[2] Sometimes termed kindergarten or pre-school classes

schools aim mainly at sense training, social training and the provision of an enriched experiential background, the schools for older children endeavour to provide a fairly wide educational syllabus up to high school standard. Some of the better state-aided schools for physically handicapped children give definite training for employment compatible with the child's disabilities. At the A. Harry Moore School, New Jersey, selected pupils may learn mechanical dentistry, watch repairing, power machine sewing, photography, toy making, etc.

At most of the schools teachers or psychologists keep some kind of record of the children's progress, and these are referred to when deciding on treatment or educational guidance. But there is very little published material giving results of research work of a psychological nature. Most of the reported research has been carried out with groups of brain-injured children some of whom are cerebral palsied and a large proportion of whom are mentally defective. The most comprehensive reports are those of McIntire and Bice, to which reference is made in later chapters.

Every State has a crippled children's agency which, as a public service, is supported by taxes, both State and Federal. Half the total annual grant from the Federal Government must be matched dollar for dollar by the State. The Social Security Act defines crippled children's services very broadly, but each State decides the details of provision for each type of handicap. Hence, while some States such as New York and California have extensive State-wide services for cerebral palsied children, provision in some other States is very meagre. Most of the States now have some educational provision for crippled children, among whom the cerebral palsied are included.

A number of universities and teachers' colleges now give special courses in teaching cerebral palsied children. These courses are in the nature of workshops where teachers can gain experience in the special problems connected with these handicapped pupils.[1]

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[1] See *Crippled Children in School*, Bulletin No. 5, 1948. Federal Security Agency, Office of Education, U.S. Government Printing Office, Washington, D.C.

The National Society for Crippled Children has done much to help the cause of the cerebral palsied throughout America, more especially in arousing interest and disseminating information about the new outlook for the cerebral palsied. In 1946 the Society formed a Cerebral Palsy Division with a Medical Advisory Council which in the following year established the American Academy for Cerebral Palsy. This advisory council, which advises on all aspects of the work, is composed of widely known specialists in the medical field of cerebral palsy, the original Council including Dr Earl Carlson, Dr Bronson Crothers, Dr George Drever, Dr Temple Fay, Dr Meyer Perlstein and Dr Winthrop Phelps.

National conferences on cerebral palsy have also done much to aid the organisation of efforts by bringing interested people together from distant parts of America. The United Cerebral Palsy Association[1] is a national organisation with headquarters in New York City and with sixteen State affiliated associations. Established in 1949, its aims are long-range and comprehensive, including the medical, educational and vocational aspects as well as aid to parents and the enlightenment of the public with regard to cerebral palsy and its implications.

The Co-ordinating Council for Cerebral Palsy in New York City, also formed in 1949, is a central co-ordinating group whose objectives embrace the furtherment of research, training of personnel, solution of problems specific to the cerebral palsied family, adequate treatment and education, etc. The Council acts as a liaison body between the various professional groups concerned with the cerebral palsied.

PROVISION FOR CEREBRAL PALSIED CHILDREN IN AUSTRALIA[2]

In the various Australian States there has been a rapid development of special provision for cerebral palsied children in the capital cities. Naturally the extent of this provision varies considerably from State to State.

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[1] For a list of educational facilities provided by associations affiliated to the United Cerebral Palsy Association reported in October 1952 see United Cerebral Palsy, 3rd *Annual Report*, 1952, p. 7.

[2] Only schools established exclusively for children suffering from cerebral palsy are described herein, no mention being made of hospital schools or schools for physically handicapped children which provide for all types of physical handicap.

As in other countries, the Crippled Children's Associations have been vitally interested in the welfare of the cerebral palsied for many years, and the first efforts at special educational provision for these children were made by the Victorian Society for Crippled Children. In 1940 a class was opened at the Children's Hospital in Melbourne, the Society financing the project while the hospital provided accommodation and medical treatment. In 1943 the Hospital took over the School completely and the number of children attending has now grown to over 150. There are about forty children from country districts and other States and these children make periodical visits of from two to six weeks and attend full-time. Between visits some of them follow the courses provided by the Victorian Education Department's Correspondence School.

The aim of the Centre is to fit the child as soon as possible into the local school system, and thereafter, in follow-up work, notes are made on his development. A special point is made of educating the parents so that they can supervise children's use of manipulative equipment at home; they also learn how to handle the cerebral palsied child in order to make him as independent and self-confident as possible.

The school is closely linked with the hospital's orthopaedic clinic under Dame Jean Macnamara. At this clinic children from the school are seen, their progress is noted and advice is given on physiotherapy or adjustment to orthopaedic apparatus. A proportion of new cases attend, as do also cases who come for a periodic check-up, *e.g.* children attending ordinary schools who still need advice or treatment. An important feature too is Dr Macnamara's attitude to the parents, whom she regards on the whole as normally intelligent, vitally interested persons who can understand her explanations and do a good deal on their own account to help their individual children under her direction.

As the Centre is a department of the hospital, the children being referred for treatment by one of the honorary medical officers, it has the full co-operation of all other departments. Hence the children are under the care of the physiotherapy department and attend each session for muscle training by experts. Where necessary they also have speech therapy or any medical treatment that is recommended.

Research over the past ten years has convinced the staff at the *Melbourne Spastic Centre* that, while the older spastic child needs help and attention, it is with the younger group, particularly the very small children, that our greatest hopes of success lie.[1] It is postulated that if we can give correct treatment to babies and very young children *before they have been allowed to become deformed* the problem is a less complicated one; moreover, we can thus greatly decrease the numbers of older children who will need our help.

The Melbourne Spastic Centre serves as a demonstration centre for those interested in the welfare of spastics and is attended by students in medicine, physiotherapy, social studies, pre-school education and infant welfare.

Further provision for cerebral palsied children is made by the Government Education Department. In addition to the usual hospital classes and special schools for handicapped children, *Marathon Spastic School* provides for twenty-eight pupils. The Spastic Children's Society has recently opened a residential hostel at Glen Waverley for the care of severely handicapped children for short periods, as a measure of relief to parents.

The Spastic Centre, Mosman, Sydney

The Mosman Spastic Centre is the most comprehensive and original one I have seen in any part of the world. The project was initiated by a group of parents of cerebral palsied children under the guidance of Mr and Mrs Neil McLeod, who, with the generous support of the people of New South Wales, have brought the venture to fruition. Almost the entire project has been carried out by voluntary donations of money, materials and labour, many parents, friends and well-wishers of the children spending holidays and week-ends building the fine medical block. The new school building has just been completed.

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[1] It is interesting to note a parallel development in the treatment of deaf children. Professor and Dr Ewing of Manchester University increasingly advocate treatment being afforded and help given to parents of very young deaf children. See *Opportunity and the Deaf Child* by Irene Ewing (Methuen and Co, 1948).

The Centre, which was opened in 1945, caters for 120 children aged from two to twenty years. The administration of the Centre is in the hands of Mr and Mrs McLeod, and Dr Claudia Burton-Bradley is medical director. Dr Burton-Bradley has been with the Centre almost from its inception and has built up a strong, efficient organisation based on scientific experiment and practical experience in handling large numbers of cerebral palsied children. She now has on her staff two other doctors who assist her in medical diagnosis and in supervision of treatment by the therapists.

The school at the Centre is maintained by the Education Department of New South Wales. There are six trained teachers, paid by the Department, which also provides a speech therapist. The children are brought to the school in twelve buses on five days a week, some of them travelling from places as much as twenty-seven miles away. The school-age children form four classes and a small group needing special attention, as well as a kindergarten class; there are two other groups of pre-school children. The schoolrooms are well stocked with suitable apparatus for teaching and for sense training, while modern methods for instructing normal children are adapted to the special needs of the pupils.

When a parent applies to have her child admitted she is interviewed and the child's suitability for admission is assessed. The mother's obstetric history is noted as well as the child's medical history, and as far as possible the probable cause of the cerebral palsy in each case is discussed.

Only children who appear to be able to profit by attendance at the Centre are admitted and all admissions are on a trial basis. If a case is not making progress after two terms the parents are asked to withdraw the child, who is then seen as an out-patient by the Medical Director at specified intervals.

Children attending the school remain under the care of their own orthopaedic specialist, to whom they make visits accompanied by the parent and therapist. The physiotherapist then carries out treatment according to individual prescription.

PLATE I The Spastic Centre, Mosman, Sydney

Plasters are made on the premises, and braces, crutches and sticks ordered from the school splint-maker[1] are checked by the physiotherapist. The Medical Director also prescribes for the individual speech therapy and co-ordinates the work of other medical specialists treating sight, hearing, etc.

Children not admitted to the school are seen intermittently and advice is given to parents on the treatment and handling of the children.

Close co-operation is maintained between therapists and schoolteachers; records are kept of work and progress, and staff meetings are held at the end of each term, when all cases are discussed.

For the midday meal the children are divided into three groups: those who can feed themselves, those who are learning to do so and those who have to be fed. As this is considered part of the therapy, the therapists supervise the meals of these groups.

The pre-school children, at present numbering about fifty, are accommodated in the treatment centre, where they are under the care of occupational therapists who guide their physical and psychological development by supervision of their habit formation, play and social adjustment. Kindergarten toys for remedial purposes are provided. These children are divided into two groups, the ambulatory and the non-ambulatory.

A recent addition to the Centre has been the residential hostel, which caters for twelve children from country districts who would otherwise be unable to take advantage of the benefits of the Centre. The permanent staff of the hostel consists of a matron in charge, a housemaid and a laundress. In addition the mothers of three of the children live at the hostel for several months and give their services voluntarily for that period, after which another three take their place. One mother does the cooking while the other two care for the children and do the housework. During the week the children attend the spastic school and have their midday meal there, so that the mothers are comparatively free during most of the day, but they have very busy periods in the early morning and late afternoon-evening. This appears to be the most satisfactory solution to the problem of the country child yet attempted at Mosman.

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[1] The advantages of having a splint shop and carpenter shop attached to the school are obvious. Provision of knee, ankle and hip joint spare parts is now continuous, and braces for all children can be supplied in the new, light but durable metals.

Other Centres

In the capital cities of three other States the intelligent cerebral palsied are provided for on a fairly comprehensive basis. In each case the school had its origins in a voluntary organisation.

In Adelaide the early venture started in 1946 by the Crippled Children's Association has grown into the *Spastic School*, where the five classes present an example of what can be done to give cerebral palsied children an education as nearly normal as their disabilities allow.

In Perth the voluntary effort had support from the Government and the Education Department in the establishment in 1952 of the *Sir James Mitchell Spastic Centre*, attended by thirty children.

The Queensland Spastic Children's Welfare League, financed by voluntary subscription, acquired a property in Brisbane in 1950 and a Medical and Education House Committee, of which the writer is a member, was set up to screen possible candidates for admission to the school which was opened towards the close of the year. The Committee meets once a fortnight to see new cases or to review old ones. The psychologist sees each child before admission to the school in order to obtain an estimate of his intelligence. There are now one hundred and fifteen children in daily attendance and all receive adequate treatment in physiotherapy and speech therapy, while a trained social worker visits the homes to help parents with their special problems and to act as liaison officer between home and school.

The *Spastic Centre* thus established on a voluntary basis has been subsidised pound for pound by the Queensland Government, while the Department of Public Instruction pays the salaries of teachers and has built the necessary classrooms. This, together with the generous support of the public, has enabled the project to make remarkable progress, and a well-equipped medical block and seven classrooms are now in use.

The original building is now a hostel for country children who need to attend the centre, and a separate residential home for the less intelligent child is envisaged. Uhl House hostel serves two purposes. Firstly, a country child in need of treatment can stay there with his parent for a period up to several weeks, and attend the centre daily for education and therapy. Secondly, if for any reason, such as the arrival of a new baby or a breakdown in the mother's health, it seems desirable for a cerebral palsied child to be taken out of his home temporarily, he may be given custodial care at Uhl House.

Scout and Guide groups provide an out-of-school interest for the girls and boys, while the Adult Spastic Club has been formed through the initiative of the social worker. The twenty-five members of this club meet twice a month and activities include play reading, discussions, films, etc. The social worker has also been instrumental in establishing local groups[1] where mothers give some service on a roster basis. The establishment of such groups of children of low intelligence may well prove a vital link in the provision of facilities for cerebral palsied children.

THE DEVELOPMENT OF EDUCATIONAL WORK WITH CEREBRAL PALSIED CHILDREN IN GREAT BRITAIN

As in the United States of America and in Australia, in Great Britain the present interest in the welfare of the cerebral palsied has grown out of the faith and zeal of a few individuals.

In 1941, in the course of voluntary work with crippled children in Manchester, Henry Weston first came in contact with cerebral palsy cases, and shortly afterwards heard of the work done in America by Phelps and Carlson. The following year he met Eirene Collis, an experienced physiotherapist who had recently returned from America, where she had worked with Phelps.

Collis's confidence in her ability to help cerebral palsied children with the new methods of physiotherapy advocated by Phelps and Weston's enthusiasm for the welfare of these handicapped children were rewarded when in 1943 the London County Council established a small experimental Cerebral Palsy Unit at Queen Mary's Hospital, Carshalton, with Eirene Collis in charge.

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[1] Similar groups were set up within the framework of the Midland Spastic Association in Birmingham following the author's research in 1949.

A small parents' group grew in 1944 into the Association for the Care of Sufferers from Cerebral Palsy, of which Weston became Honorary Secretary. This was the forerunner of the present British Council for the Welfare of Spastics, which dates from December 1946 and which, in collaboration with the Scottish Council for the Care of Spastics, was the main co-ordinating body, under Weston, of the early work with the cerebral palsied in Great Britain.[1]

The objects of the Council follow those laid down in a 'Bill of Rights for the Handicapped Child' which was drawn up at a conference on 'Children in a Democracy' convened by the late President Roosevelt at the White House in Washington in the early years of the war: 'Not only for its own sake, but for the benefit of society as a whole, every crippled child has the right to the best body which modern science can help it to secure; the best mind which modern education can provide; the best training which modern vocational guidance can give; the best position in life which its physical condition—perfected as best it may—will permit; and the best opportunity for spiritual development which its environment affords.'

In 1945 local Ministry of Health authorities in ten Lancashire towns were asked to return figures giving the incidence of known cerebral palsy cases in their areas. The total returned, covering ages 0-16 years, was 500. The Ministry of Education had become increasingly interested in the problem, especially since the establishment in 1946 of the St Margaret's school at Croydon, a venture based on funds from private sources.

St Margaret's is a residential school catering for cerebral palsied children from all parts of the country. Being the first of its kind, it had various teething troubles before it became firmly established as a school for normally intelligent cerebral palsied children. As it is within the Greater London area it serves as a training centre for therapists.

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[1] Since this was written new centres have been set up, including those of the National Spastics Society which is engaged in work covering various aspects of the care and education of spastics.

It was evident that if we were to cater adequately for these handicapped children we should be well advised to examine carefully the projects already in being in America and Australia. It was for this reason that certain doctors, physiotherapists and psychologists visited established centres abroad. In 1946 the National Foundation for Educational Research, in conjunction with the Ministry of Education, appointed Marjorie Dunsdon to study problems concerning the education of cerebral palsied children. She visited American centres and then engaged upon a review, lasting until 1950, of some aspects of education for cerebral palsied children in England and Wales. Meanwhile, in 1947, the writer commenced her research at the Birmingham medical school and in the following two years visited the established spastic centres in Australia (1948) and the chief ones on the eastern seaboard of America (1949). Visits to established centres are of vital importance to research workers and those interested in the administration of new centres.

In September 1948 two new schools were opened for cerebral palsied children, Westerlea in Edinburgh and the Carlson House School for Spastics in Birmingham. *The Carlson House School*, being intimately connected with the author's research, is described fully in Chapter XIII.

Westerlea School in Edinburgh grew from the goodwill of the Scottish Branch of the British Red Cross. A charming house, set in a beautiful garden, was bought and furnished, and the Scottish Department of Education gave generous maintenance grants. Fees are paid by local education authorities who send children to this residential school.

Following on these early projects further schools and units were established. In Devon the *Dame Hannah Rogers School* was established at Ivybridge. Here residential schooling is provided for children from all parts of the country, with priority given to those from Devon and Cornwall.

Puckle Hill House in Kent caters for a very difficult age group —adolescents of fourteen to twenty-one years—from all parts of the country. In addition to ordinary schooling its functions include gardening, poultry keeping, domestic science, handicrafts and so on.

So urgent was the need for school provision and so few the research workers available that all of these schools, except Carlson House, have selected their pupils from waiting lists compiled from available names of cerebral palsied children. Only in the case of Carlson House was there a careful survey of all cerebral palsied children in the district to ascertain the most suitable children for inclusion, although most centres and schools give either a preliminary 'screening' or one soon after admission, to ensure that pupils are of an adequate intellectual level.

In addition to the schools here enumerated cerebral palsied children are being cared for in other centres not specifically devoted to cerebral palsy, and in a number of schools for physically handicapped children.

The Education Act 1944, Section 33,[1] made it obligatory for all local education authorities to provide special education for all children suffering from disability of mind or body. Amongst the eleven classes of handicapped children specifically named are the physically handicapped, 'that is to say pupils, not being pupils suffering solely from a defect of sight or hearing, who by reason of disease or crippling defect, cannot be satisfactorily educated in an ordinary school or cannot be educated in such a school without detriment to their health or educational development'.

This new responsibility placed upon local education authorities has led to further demands for the establishment of schools and, moreover, has placed voluntary bodies in a more favourable position. Whereas they had previously to assume the bulk of the financial burden of special educational provision, they can now be reimbursed fifty per cent of the initial cost of establishing a special school, and the Ministry of Education and local education authorities assume the responsibility of maintaining it thereafter, the local education authorities paying appropriate fees for children living in their districts.

A considerable advance in the provision for cerebral palsied children has been made during the last eight years, but much still remains to be done before the majority of cerebral palsied children in Great Britain have adequate educational opportunities for developing their potential abilities to the maximum.

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[1] Education Act 1944, H.M.S.O., York House, Kingsway, London, W.C.2. See sections 8 (2) (c) and 33, and also *Handicapped Pupils School Health Services Regulations*, August 1945 (H.M.S.O.) and *Handicapped Pupils and School Health Services Amending Regulations*, July 1946.

SUMMARY

From the information given in this chapter it will be seen that special educational provision for cerebral palsied children has developed broadly along similar lines in America, Australia and Great Britain. In each country the initiative has been in the hands of a few enthusiasts; generous contributions of money and labour by voluntary societies and by the public have enabled the organisers to establish schools and centres; hospitals and/or special schools have opened units for cerebral palsied children; and finally state aid has been forthcoming either to subsidise established schools or to set up new classes. But, whereas in America some of the best known schools charge high fees, in Australia and Great Britain all the special education is provided free.

PART TWO:

THE SURVEY

CHAPTER IV

THE BIRMINGHAM RESEARCH PROJECT

In Part One we considered in general terms some of the main points connected with the nature and aetiology of cerebral palsy and surveyed the development on the educational and psychological sides of the provision for cerebral palsied children in U.S.A., Great Britain and Australia. In this section of the book (Chapters IV to XI) I give details of the Birmingham research, which, in addition to yielding findings of intrinsic worth on the problem of cerebral palsy, provided valuable information for the planning and development of a school for these handicapped children.

The Birmingham research project had two aspects, the developments of which were intimately connected at every stage of the research. On the one hand there was the University of Birmingham survey described below, while proceeding alongside this was the planning of the first day school for cerebral palsied children in Great Britain, the Carlson House School for Spastics[1] at Birmingham.

In October 1947 Professor Smellie, the Head of the Department of Paediatrics and Child Health at the Children's Hospital, University of Birmingham, decided to institute a medical and psychological survey of cases of children suffering from cerebral palsy in the West Midland area of England.[2] The main purpose of the survey was to obtain information on the causation, incidence and educability of cerebral palsied children in and around Birmingham. In general it was hoped to obtain answers to such questions as:

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[1] The establishment of this school is discussed in detail in Chapter XIII.

[2] The work was carried out by a medical practitioner (Dr Patria Asher) and a child psychologist (the writer) and occupied the period November 1947 to March 1949. A specimen copy of the Cerebral Palsy Record Form used in the survey is given in Appendix A.

(1) What factors enter into the causation of cerebral palsy in English children?

(2) What is the incidence of cerebral palsy among children in Great Britain?

(3) What proportion of these children come within the normal range of intelligence of the ordinary school population?

(4) How many of these children already obtain adequate education?

(5) How many are too handicapped to attend an ordinary school and are not receiving education?

Before beginning the investigation it was necessary to plan the work so that we obtained information on all conditions related to the children's psychological characteristics and possible education. These were: their level of mental ability, their sensory powers, their physical equipment, their mental attitudes, their environmental conditions.

All these factors were considered in the study, so that the planning of the psychological and educational aspects of the investigation included the following requirements:

(1) To estimate the intelligence of all children who were deemed to be cases of cerebral palsy.

(2) From the information derived from giving individual psychological tests to a large number of cerebral palsied children of varying degrees of physical disability and of different temperaments, to provide guidance on the particularly difficult problem of adequately assessing the intelligence of cerebral palsied children and to formulate possible lines of approach for their education.

(3) To collect data on the psychological implications of cerebral palsy for children so afflicted and for parents and teachers who are concerned with the education and training of these children.

(4) To give a standardised reading test to all children capable of responding to it and so to obtain information that would be useful in formulating principles on the teaching of reading to cerebral palsied children.

(5) On the research results obtained to base a programme for the form of education most effective for children of varying degrees of physical disability and mental powers.

(6) To make use of the information and experience gained in sections (1) to (5) in the selection and the education of children in a new school and centre for cerebral palsied children.

SELECTION OF CASES[1]

Cases for the investigation were selected in the first place from lists of names supplied by all doctors on the medical registers of the West Midland counties of Warwickshire, Staffordshire, Worcestershire, Shropshire and Herefordshire. These lists were supplemented by names referred from a variety of sources, such as medical officers of health, school medical officers, head teachers, and directors of institutions of various kinds. Because it was found that the lists from Shropshire and Herefordshire did not give a sufficiently effective sampling the research proper was confined to children whose homes were in the counties of Warwickshire, Staffordshire and Worcestershire. 466 children were examined and sixty-six were found to have some condition other than cerebral palsy, usually uncomplicated mental deficiency.

Throughout the survey every effort was made to spare the children unnecessary physical and mental strain. For this reason they were examined in a variety of places. The majority of the cases were seen in the Cerebral Palsy Clinic at the Children's Hospital, Birmingham, but others were brought to special clinics in centres near their homes. Children in hospitals or institutions were seen in their familiar environment, while a number of children were examined at home.

Children were seen by appointment, transport being provided for the more handicapped. An endeavour was also made to see younger children early in the day to reduce the fatigue element which might have affected their reactions in the psychological tests.

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[1] This was the first large-scale survey of its kind done in Great Britain. McIntire in America carried out a survey of cerebral palsied cases under the age of twenty-one years who attended clinics in New Jersey. See The Incidence of Feeble-Mindedness in the Cerebral Palsied by J. Thomas McIntire, *American Journal of Mental Deficiency*, Vol. 6, No. 4, pp. 491-94, April 1946.

DISTRIBUTION OF 354 CASES ACCORDING TO AGE AND SEX

In all, 354 children between the ages of three and fifteen years were seen. Details of the distribution of these cases according to sex and age are set out in Table I. It will be seen that 55 per cent of the cases were boys and 45 per cent girls. Although there is evidence[1] from other countries that there are slightly greater numbers of boys than girls amongst cerebral palsied children, the difference found in this investigation is not statistically significant, *i.e.* it may have been due to chance.

As regards distribution throughout the age groups, there are relatively high peaks in the five-year-old groups of both sexes and in the nine- and eleven-year-old groups of boys. The former increase may be explained by the fact that while cerebral palsy cases of three and four years of age may not have been brought to notice, at five years of age they are likely to be notified on account of registering for admission to or exclusion from school. All differences between numbers in the various age groups may, however, be due to the normal variations in sampling.

TABLE I

Distribution according to Age and Sex of 354 Cases of Cerebral Palsy

Age in years*	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	%
Boys	19	13	28	17	11	8	26	15	23	8	6	9	10	193	55
Girls	14	16	25	16	12	8	16	14	11	10	10	4	5	161	45
Total	33	29	53	33	23	16	42	29	34	18	16	13	15	354	

* *i.e.* 3:0-3:11; 4:0-4:11; etc.

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[1] Dr J. Van Assen, speaking at the Fourth World Conference of Workers for Cripples, London, 1939, said: 'From various statistics for Sweden and for Holland it appears that the number of boys with cerebral lesions exceeds that of girls in the proportion of three to two.' *How Can We Assist Children Crippled by Cerebral Lesion, especially those who are Mentally Defective?*

McIntire reports that of 500 cases in his study 58 per cent were males and 42 per cent females. See Incidence of Feeble-Mindedness in the Cerebral Palsied, *American Journal of Mental Deficiency*, Vol. 6, No. 4, April 1946.

INCIDENCE OF CEREBRAL PALSY[1]

Although every effort was made to get a complete register of cases of cerebral palsy in the area stated, an examination of the numbers from various districts suggested that it would be unwise to assume that our list was completely satisfactory. For this reason no attempt was made to assess the incidence of cerebral palsy over the three counties. On the other hand, there was adequate evidence to show that the returns for the four cities Birmingham, Coventry, Walsall and Stoke-on-Trent were comprehensive and were sufficiently reliable for an estimate to be made of the incidence of cerebral palsy among school-age children. The figures relating to these results are given in Table IIA.

TABLE IIA

Incidence of Proved Cases of Cerebral Palsy seen in Four County Boroughs

Borough	Population aged 5 to 15+	No. of C.P. aged 5 to 15+	Incidence per 10,000
Birmingham	144,000	110	7·6
Stoke	39,583	23	5·8
Coventry	32,836	31	9·4
Walsall	17,330	13	7·7

The low figure for Stoke is accounted for by the fact that no low-grade defective cerebral palsy cases (imbeciles and idiots) were seen in this town, where nearly all our cases were referred by the school medical officer.

A more accurate estimate of the incidence of cerebral palsy in the four towns is obtained if we add to the above figures 85 per cent of the cases referred to us as part of the survey *but not yet examined in these cities*, for almost exactly 85 per cent of the referred cases proved to be cerebral palsied. Table IIB shows the numbers thus obtained for Birmingham and for the three smaller towns combined.

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[1] For the tables in this section on incidence I am indebted to my colleague, Dr Patria Asher, who has kindly allowed me to include these figures from our joint report. See A Survey of 400 Cases of Cerebral Palsy in Childhood by Patria Asher and F. Eleanor Schonell, *Archives of Disease in Childhood*, Vol. 25, No. 124, December 1950.

TABLE IIB

Incidence of Cerebral Palsy in Birmingham and in Three Other Towns of the West Midlands

Borough	Population aged 5 to 15+	Suspected cases not yet seen aged 5 to 15+	Cases seen plus 85% suspects aged 5 to 15+	Incidence per 10,000
Birmingham	144,000	26	132·1	9·2
Stoke Coventry Walsall	89,749	14	78·9	8·8

It will be observed that the overall incidence figure in this table is approximately 9 per 10,000 and we feel that, considering the thorough-going and conscientious manner in which the investigation was carried out, we may suggest that the probable *incidence of cerebral palsy among school-age children is approximately one per thousand.*

This figure is very much lower than the estimate given by Phelps in 1941[1] for incidence of cerebral palsy in America. He estimates that seven cerebral palsied children[2] are born each year per hundred thousand total population, and of these seven one dies before the age of three years. On the basis of ninety-six cerebral palsied children under sixteen years of age per hundred thousand total population, Birmingham, with a million inhabitants, would have nearly one thousand cases. We found fewer than two hundred, including the under fives. However, Phelps does not give details of the data on which his calculations are based and therefore no real comparison of incidence can be made. On the other hand, a recent American publication by Pohl[3] states that 'statistics from the city of Minneapolis, Minne-

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[1] Winthrop M. Phelps, Cerebral Palsy, *The Journal of the Iowa State Medical Society*, December 1948 and *The Farthest Corner—An Outline of the Cerebral Palsy Problem* (National Society for Crippled Children and Adults, Chicago, 1943)

[2] Dr Myre Sim points out to me that the higher figure in America may be accounted for in part by the greater mixing of different blood groups, leading to a possible higher incidence of Rhesus incompatibility.

[3] See *Cerebral Palsy* by John F. Pohl (Bruce Publishing Co. Saint Paul, Minnesota, 1950, p. 1).

PLATE 2 Senior Class, Queensland Spastic Centre

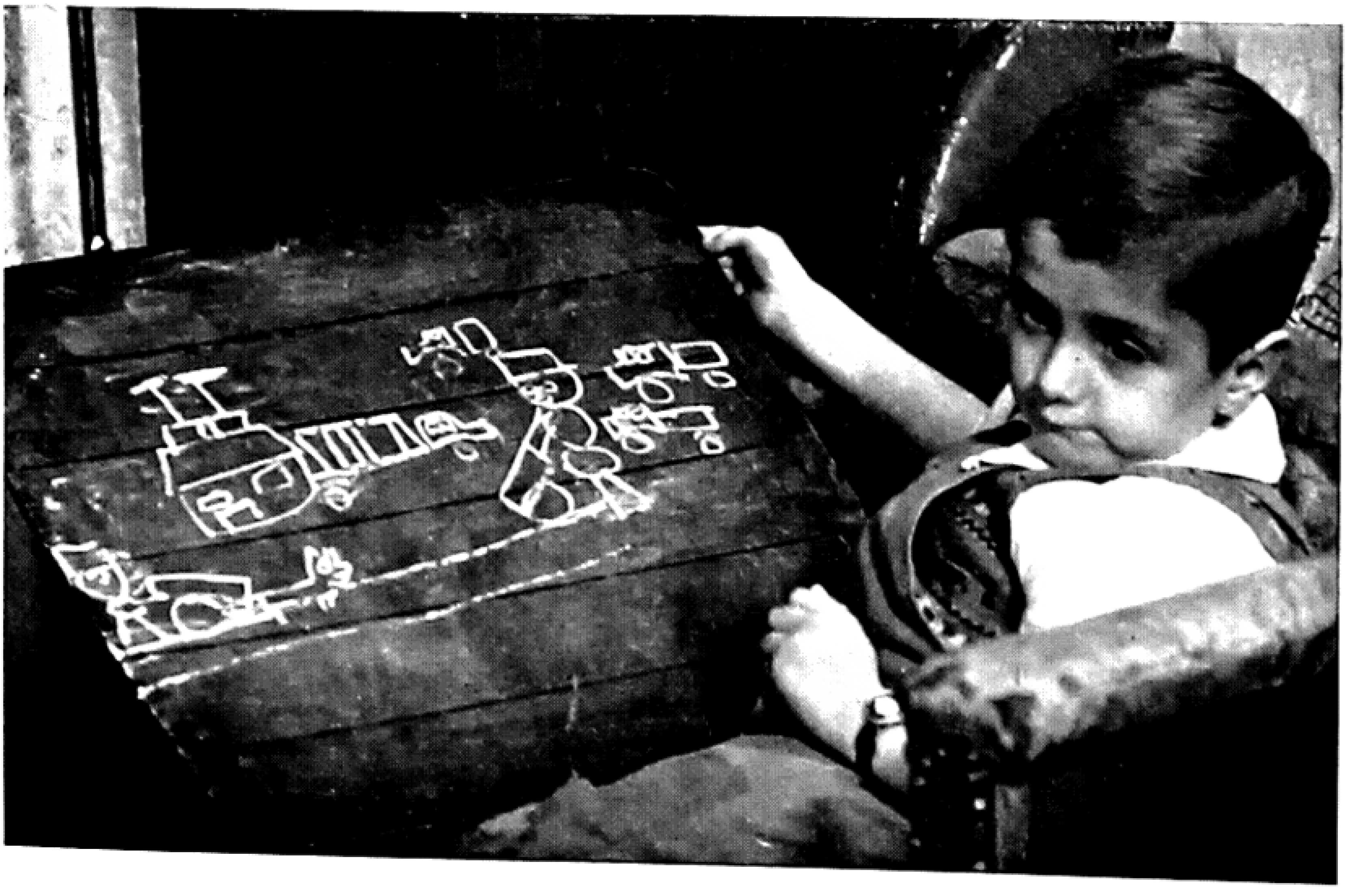

PLATE 3 Boy with drawing of the chimney sweep

sota, indicate that a child with cerebral palsy is born and survives on the average once for each 568 live births'. This estimate of incidence, it will be observed, agrees more nearly with our figure than it does with that of Phelps.

In two areas of Britain preliminary surveys of incidence were made. In 1947 Dr Cohen obtained numbers of cerebral palsy referrals in Sheffield and his incidence figure was approximately 2·2 per thousand school children.[1] These cases were not examined at a central clinic and therefore may have included a percentage of incorrect referrals, perhaps mentally defective children, such as occurred in our survey. The other preliminary survey was made in Glasgow, where Professor Mackintosh estimated the incidence of cerebral palsy to be 1·2 cases per thousand children of school age.[2] This latter figure is closer to that obtained in our Midland survey. More recently Miss Dunsdon carried out a more general survey of cerebral palsied children in England and Wales, basing her conclusions on data obtained from a large number of local authorities. Her estimate of incidence confirms our finding of approximately one per thousand.[3]

Further diagnostic surveys will doubtless supplement these figures, but it appears highly unlikely that incidence of cerebral palsy in Great Britain will be comparable with the high figure given by the earlier workers in the United States of America.

[1] Personal communication

[2] Address by Professor Mackintosh to the British Council for the Welfare of Spastics, 1946

[3] M. I. Dunsdon, *The Educability of Cerebral Palsied Children* (Newnes Educational Publishing Co, London, 1952, p. 125)

CHAPTER V

ESTIMATING THE INTELLIGENCE OF CEREBRAL PALSIED CHILDREN

THE two factors that have most influenced the work done with cerebral palsied children in evaluating their intelligence are their physical handicap and the common belief that most cerebral palsied children are mentally deficient. The result has been that much of the research reported concerns small groups of cerebral palsied children, mostly in institutions of one kind or another. In such cases it is difficult to conceive of any useful or reliable conclusions being drawn in regard to the educability of cerebral palsied children in general; usually deductions from the researches have been put forward only as very tentative suggestions.

But the real value of these researches has been the realisation on the part of the investigators that the cerebral palsied are a unique group, that the testing of such children should be in the hands of a psychologist experienced in handling physically handicapped children and that research on suitable tests and techniques of administration should be carried out. As Doll says, 'This means that in the application and interpretation of tests and measurements with birth-injured subjects exceptional skill, tact and patience are required as well as considerable background in clinical psychology, supplemented by special knowledge of neurologically handicapped subjects'.[1] And again Gesell[2] has found that 'the success of all diagnosis and still more of prognosis naturally depends upon clinical experience'.

A study of the various attempts to evaluate the intelligence of cerebral palsied children reveals that 'the I.Q. is a good measure of intelligence *only when we can be sure that factors other than intelligence have not affected the child's performance to a significant extent*'[1]—a vital point constantly and strongly revealed during the Birmingham research.

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[1] Edgar A. Doll, Winthrop M. Phelps, and Ruth T. Melcher. *Mental Deficiency due to Birth Injuries* (The Macmillan Co, New York, 1932, p. 161)

[2] Arnold Gesell, and Catherine S. Amatruda. *Developmental Diagnosis, Normal and Abnormal Child Development* (Hamish Hamilton Medical Books, London, 1947, p. 106)

These other factors that affect performance may include the child's physical disability, his sensory impairment, his speech defect and his lack of experience due to these handicaps. It is helpful to consider these factors from two points of view, both of which have a direct bearing on the use of intelligence tests for cerebral palsied children. These considerations are the effect of the handicap on the child's physical ability *to respond to the test situation* and *the cumulative effect of the handicap on the child's fund of knowledge and facility in reasoning due to his lack of experience in the everyday activities of the normally equipped child.*

RESPONSE TO THE TEST SITUATION

Many cerebral palsied children have normal or almost normal sensory powers which enable them to assimilate knowledge, but if they are severely handicapped in speech and/or co-ordination of the hands their ability to express themselves is adversely affected. In such cases it is of little value to administer a test without due consideration of the child's physical limitations. 'What may be a test of natural adaptability for a child equipped with all the normal possibilities of physical response may prove to be a test of special ability for children with motor handicaps. In view of the physical disabilities described above, it is easy to see how speed of performance, for example, may be a test of the efficiency of general adaptive ability of a normal child, but only a test of motor facility for our subjects, because their neuro-muscular responses may lag behind their intellectual reactions.'[2]

On the other hand, a child may have the means for adequate expression but may have a sensory defect which limits his ability to respond to tests because he either does not see or does not hear effectively, *e.g.* if he has double vision or high frequency deafness. One girl, nine years of age, tested during the survey, had double vision. She passed tests requiring good auditory perception, memory and reasoning, but failed continuously on tests necessitating normal vision. After she failed on a picture test she was asked to describe the picture before her, but her description soon revealed the fact that all she saw was a blurred approximation to the original.

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[1] Charles R. Strother, Evaluating Intelligence of Children Handicapped by Cerebral Palsy, from *The Crippled Child*, October 1945

[2] Doll *et al.*, op. cit., p. 82

In such cases, where a testee's response is adversely affected because of his physical or sensory handicap, it seems reasonable to modify the administration[1] and/or scoring of the test, if no other test is suitable for the particular individual.

Bice has drawn attention to the lack of understanding of this problem in some quarters when he wrote: 'The Binet Scale appears to be used in some cases in as mechanical a manner as a student nurse might use a clinical thermometer, and with no more comprehension of the implications of the results.'[2]

CUMULATIVE EFFECT ON MENTAL LEVEL DUE TO LACK OF EXPERIENCE

Todd suggests that 'Interpretation is affected through an association of ideas or memories of various cumulative experiences, muscular and tactile, and of visual impressions of colour and size. This is due to memories of former experiences—movement of the eye, movements of the body in going towards objects and reaching them, together with tactile impressions of their shapes, extent and texture derived from handling them.'[3]

It is clear that children who have physical and/or sensory handicaps of a severe degree will be at a disadvantage from the point of view of experience when judged by standards set up for normally equipped children. In the course of the survey there was evidence in a great many cases of a poor sense of spatial relations, due very probably to lack of experience rather than to any special innate limitation.[1] 'Existing tests, built and standardised as they are upon the responses expected of orthopaedically sound subjects, do not allow for the cripple's limited environment, nor his sensory distortion. His speech handicap may be allowed for in the administration of the test, but the fact that his lack of adequate speech has greatly impeded his acquisition of knowledge is in no way rationalised.'[2]

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[1] See Chapter VI, where modifications of the Stanford Binet Test used in the survey are discussed.

[2] Harry V. Bice, A Decade of Psychology, *Amer. J. of Mental Deficiency*, Vol. 53, No. 1, July 1948, p. 58

[3] M. E. Todd, *The Thinking Body* (Paul B. Hever, New York, 1937)

THE PSYCHOLOGICAL INTERVIEW

The most baffling problem in the testing of cerebral palsied children is that of the child who has severe disability of the hands combined with little or no speech. Unfortunately there is at present no test which is really suitable for assessing the intelligence of these children and the most that the psychologist can do is to use his ingenuity to evolve special ways of helping the child to make known his response to test items. Many of these children convey most of their wishes and opinions in some kind of 'eye language' which is understood by their parents and colleagues. Hence, perhaps the most effective results can be obtained from such children by encouraging this 'eye language' for answering questions. One little athetoid friend of mine has a system of winks which she uses with great facility; one wink means 'yes', two mean 'no', and so on. Thus by using a wink and a glance in a certain direction or at a particular object or person she is often able to express her understanding of the situation.

When a child is so badly handicapped that normal means of response are impossible, then it is useful to employ testing procedures slightly different from the standardised form, if by doing so the psychologist is enabled to evaluate, however roughly, the child's mental level.

In the Birmingham experiment the psychological interview was carefully planned and the same procedure was followed throughout the survey. As many of these children had had treatment and/or operations, and hence were somewhat apprehensive of examination and treatment centres, every effort was made to obtain complete rapport and to dispel any anxiety or tension likely to be associated with the situation.

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[1] Lord suggests that 'children with cerebral palsy who are likely to have difficulty in writing, presumably because of a sensory rather than a motor defect, persist in the simple downward stroke long after the normal child is copying a circle or a cross'. Elizabeth E. Lord, *Children Handicapped by Cerebral Palsy*, p. 37

[2] W. Elvis Bosley, Assessment of Intelligence in Cerebral Palsy Cases, *Spastic Review*, September 1945

After a preliminary chat with the mother and child, during which time a note was made of the child's age, school (if any), leisure and other pursuits, the child was given the Terman Merrill Revision of the Stanford Binet Intelligence Scale. Whenever possible the mother was asked to withdraw while the psychological test was in progress, but when such a course seemed prejudicial to the success of the test the mother was allowed to remain in the room. In the testing of cerebral palsied children an important feature appears to be flexibility in handling the human situation[1] involved while maintaining a strictly scientific attitude towards the administration of the test.

While realising that with moderately and severely handicapped children estimates of intelligence are likely to be somewhat inaccurate, it seems more reasonable to employ a reliable standardised test to get a tolerably objective measure of the child's capacity rather than to rely on subjective assessments.

It is recognised that these estimates, especially with the severely handicapped, do not signify the upper limits of their intelligence, but they do yield a basis on which to begin work. If the child is more intelligent than the test result has led us to anticipate, then he will soon progress with suitable teaching methods and adapted material. Careful physical and sensory examinations, together with the individual teaching that such children should have in a special school, will enable him to make the most of his abilities. The important thing to know is the *approximate* mental level of each child so that he can be assigned the type of education or training most suited to his ability.

It is a cardinal principle that in the mental assessment of handicapped children results should be based not merely on the test scores but on a consideration of the child as a whole, his disabilities, his past opportunities and experience, his behaviour at home and at school as well as during the test, and his total learning capacity as far as can be ascertained.

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[1] The results of various investigations suggest that the effectiveness of the testing may be dependent upon the tester, *e.g.* Relation between Intelligence and Proficiency in Binet-Simon Testing by M. Boole Stott, *Brit. J. Educ. Psy.*, June 1940.

The Stanford Binet Intelligence Scale is now generally accepted as the most useful test for assessing the intelligence of cerebral palsied children, although it is realised that other tests may provide supplementary information in certain cases. In almost all cases where paucity of speech makes use of the Binet Scale unreliable, the cerebral palsied child also has severe hand inco-ordination which precludes the use of performance tests. Furthermore, from the very nature of the disability it is obvious that developmental scales and schedules are of little value with these children.

CHAPTER VI

USE OF THE TERMAN MERRILL INTELLIGENCE SCALE

ALTHOUGH the Stanford Binet Intelligence Scale (Terman Merrill Revision) was found to be the most suitable for testing cerebral palsied children,[1] it should be noted that the verbal element of the test limits its usefulness with those children who have speech difficulties, the performance and written requirements restrict those with hand disabilities or inco-ordination, and the items to some extent dependent on scholastic attainments penalise those who have been denied educational facilities. It is not improbable, too, that the Scale is weighted with the kind of experience which the normal child absorbs by moving about in his environment, and which is denied to many handicapped children.

The effect of these limitations on the measuring instrument would be to give a slightly lower estimate of intelligence than would be expected from a normal group, but, since what we wish to measure is intelligence as it issues in action within the child's limitations, but under favourable circumstances, the Scale probably gives a more useful estimate than would an instrument—if such could be devised—which allowed for the cumulative effects of handicap on mental development. Experience with the Terman Merrill Test suggests that if it is administered with understanding and interpreted with caution a reliable estimate of intellectual potentiality may be obtained in the majority of cases. This does not include the very young[1] or the very severely handicapped.[2] In this survey it was possible, by using the Stanford Binet Scale (Terman and Merrill, Form L), to obtain estimates of intelligence for 340 of the 354 children between the ages of three and fifteen years.

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[1] Doll *et al.* after experimenting with eight tests of intelligence indicated that the Stanford Binet was the most useful for testing brain-injured children as it is less influenced by 'handicaps of speech, motor control, experience and training'. E. A. Doll, W. M. Phelps, and R. T. Melcher, *Mental Deficiency due to Birth Injuries* (The Macmillan Co, New York, 1932, p. 149)

Brereton administered the Stanford Binet Intelligence Test and the California Test of Mental Maturity to paired cerebral palsied and non-cerebral palsied children, analysed the results and summed up her deductions thus: 'No evidence has been educed to the effect that specific characteristics in the thought processes or in the type of error made by cerebral palsied children result in scores being obtained that vary according to the material of a particular test rather than to the over-all ability of the children.' See Commonwealth Office of Education (Australia) Research Report No. Nine, prepared by B. LeGay Brereton, *The Educational Potentialities of Cerebral Palsied Children*, p. 22.

Children with severe sensory defects give unreliable results, and with children suffering from marked speech defects and pronounced inco-ordination of the hands only approximate estimates of mental power can be obtained. Some cases are completely baffling. One interesting but difficult case was a boy of 6½ years, a spastic quadriplegia with slightly defective sight, defective hearing, and no speech. As he had a fair degree of facility with his hands the Moray House Picture Test and Koh's Blocks were employed to supplement the findings from the Terman Merrill, but no further evidence was procured to support the suggestion that he might be of normal or nearly normal intelligence. He had been having speech therapy and learned to say a few half-intelligible words. A certain amount of simple education was also given. One interesting feature of this case was the fact that although the boy made little or no effort to express himself verbally, he did so voluntarily with a chalk and board. The photograph in Plate 3 (facing page 36) was taken after the boy had told his mother, pictorially, that the sweep with his horse-drawn cart had visited the house opposite. As will be realised from an examination of the picture, the boy had seen the sweep arrive and go into the house. He had also seen the brush appear through the top of the chimney.

When first interviewed, this boy, who used his left hand, was writing his name in mirror writing and in doing his drawings made all his movements from right to left. Efforts were made to determine hand and eye dominance but no reliable decision was reached. Attempts were then made to establish right hand dominance.

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[1] See Chapter VII for discussion on the inadvisability of forming estimates of intelligence for very young cerebral palsied children.

[2] For obtaining an approximate estimate of intelligence with the 3 or 4 per cent of most severely handicapped children Dr Martin Palmer's staff at the Institute of Logopedics, Wichita, Kansas, are 'developing an intelligence test that will measure capacity to learn'; not a highly refined test, but one which will grade children as good, average or poor. See Arthur Mayfield, Tests that Will Test. *The Crippled Child*, February 1948.

The handicaps of the cerebral palsied are so numerous and so diverse that each child presents an individual problem and needs to be considered as such. Hence there is the need for a really clinical approach in this work.[1] It was soon evident in the investigation *that if the test were administered and scored with strict adherence to the instructions, then it would certainly penalise a proportion of the more handicapped children.*

Hence, for research purposes two scores were made for each child tested. The first entry was the *tested I.Q.*, obtained when the instructions were adhered to, irrespective of the child's handicaps; the second entry was the *modified I.Q.*, obtained by scoring as successes items which the psychologist judged the child would pass except for some special disability which prevented him from carrying out the instructions of the tester. A third I.Q., the *estimated I.Q.*, was then noted and for each child a short report was written explaining the estimated I.Q. where this differed from the tested and modified I.Q.s.

This triple I.Q. entry was made for the specific purpose of discovering *to what extent the Terman Merrill Test was useful for cerebral palsied children when used with strict adherence to the standard rules of administration*, and *how far one was justified in using the Test as a basis on which to build an estimated I.Q. for the more handicapped cerebral palsy child.*

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[1] As Burt points out, the items of the Terman Merrill Scale have been arranged according to a plan of 'external' instead of 'internal' grading. The standardisation of each problem in terms of mental age assumes that the order of difficulty is constant for different types of children from different environments. Where conditions differ markedly for particular children, as in the case of handicapped children, there is every need to examine carefully the results on every item. The order of difficulty of the tests may be quite different because of the differences in special experiences of the children; thus for children with hand defects or speech defects we need to consider carefully their responses in certain tests and to make allowances for special conditions. Latest Revision of the Binet Intelligence Tests, by C. Burt in *Eugenics*, R.30, January 1939, pp. 255-60

THE MODIFIED I.Q.

The slightly handicapped cerebral palsied child usually responded to the test situation as well as though he had no physical disability; and this also applied to many of the moderately handicapped children where speech and hand co-ordination were only slightly impaired.

Modifications in the administration of the test were necessary only where the child's response was adversely affected on account of such handicaps as marked disability of the hands, serious speech impairment, or multiple handicaps.

Inco-ordination of the Hands

When a testee was succeeding with the other items of an age group but would have failed on a test requiring good hand co-ordination the test administration was slightly modified to avoid penalising the child for his physical handicap. In such cases the psychologist steadied the pupil's hand or hands while leaving him completely free to execute the movements he was desirous of making. Items illustrative of this are: the block bridge III, 3; bead threading III, 1; VI, 2; pointing to indicate choice IV, 5; paper folding V, 2; maze VI, 6; drawing geometrical figures and designs V, 4; VII, 3; plan of search XIII, 1. In cases such as drawing geometrical figures or designs a success was scored if the child's movements were definitely in the correct direction even if the finished products were not a fair copy of the original.

In a few cases, where the hand disability was too great to allow of using a pencil, successes were scored if the pupil could adequately describe how the drawing should be executed. It was considered that this was a much more difficult task than actually drawing the figure or design and therefore should be allowed. Two examples of intelligent, badly handicapped boys will illustrate the advisability of this procedure:

Brian, a severely handicapped boy of nine years of age, could not hold a pencil but told the tester to draw a square for him thus: 'Draw a straight line a little more than an inch long; now a right angle. Another line the same as the first; now another right angle; another line like the first and join up the square.'

Eric, a severely disabled boy of fifteen, who could not hold a pencil, quickly described the drawings for the paper cutting test I, and the correct sequence for the bead chain test. As he eventually scored some successes in the Superior Adult III Group, it would obviously be unfair to fail him at Year XIII because of his physical inability to carry out the required directions.

Similarly, at Year VI if a child cannot use his hands but can indicate from three piles of differently shaped beads which ones should be threaded to make the pattern, he has accomplished something more difficult than the child who has only to attend to his mental image of the bead chain while selecting beads from a box before him. In such cases it seems advisable to disregard the time factor. In actual practice in the survey this modification seldom resulted in a successful completion.

Serious Speech Impairment

The effect of speech impairment on a child's ability to succeed with the items of the Terman Merrill Scale depends to a large extent on the degree of the handicap and may be direct or indirect in its manifestation.

The indirect effect of serious speech impairment is not easy to estimate as it involves a large part of the experiential background against which the child has developed. Here we are concerned with the direct effect of a speech handicap on the child's ability to respond to test items.

In my experience the decisive factor in testing a child with speech disability is not *how well* he can speak but simply *if* he can speak. With young children even monosyllabic responses are sufficient to give a satisfactory indication of their understanding of the material presented, and with older children some estimate of intelligence can be obtained so long as their speech is intelligible to an ear experienced in interpreting cerebral palsied children's speech.

One of the main difficulties encountered in testing these children is that many of them are of the athetoid type who make constant involuntary movements of the head, so that it is still more difficult to understand their half-articulate speech. This is particularly so when the child is endeavouring to co-operate; usually the harder he tries the worse do his involuntary movements become.

Typical of this kind of child was Eric, mentioned a little earlier. He was an intelligent boy of fifteen who had never been to school but who had attained a high level of intellectual development from education given him by his parents, supplemented by the use of the British Broadcasting Corporation radio programmes for schools. In certain directions his interests and understanding were considerably superior to those of the average boy of his age. During the test his co-operation was of the best, but even so it was a most difficult task for the psychologist. Eric listened intently to each question and would have appeared to an observer to be a normally adjusted boy. But as soon as the tester ceased speaking and Eric attempted to reply he manifested continuous uncontrolled movements of arms and legs, while his efforts at speech were only just intelligible. Yet despite this he thoroughly enjoyed the test, especially the later stages when he reached the last items of the test for Superior Adult III.

Cases of Multiple Handicap

The cases which present the greatest problem to the mental tester are those with multiple handicaps, and it is for these children that we can usually obtain only a rough estimate of intellectual level. This estimate should be regarded merely as an indication of their probable minimal intelligence level, and it should be supplemented by information obtained from those who study them in school and during treatment. Re-tests at intervals of perhaps twelve months can sometimes be most useful in indicating whether the original estimate should be confirmed or revised.

Little or No Speech plus Severe Disability of the Hands

When extreme disability of the hands is combined with complete lack of speech there appears to be little hope of estimating the child's intellectual level. Fortunately such cases are infrequent and where they do occur a high proportion suggest, by their lack of response to stimuli, that they are of a low level of intelligence. But occasionally one finds one of these children whose general reactions would lead one to expect normal intelligence. Then the child should be given speech therapy and physiotherapy as well as some simple education before regarding him as ineducable in the narrower sense.

When severe hand inco-ordination is accompanied by monosyllabic speech the task of assessing intelligence is also extremely difficult and it taxes the ingenuity of the tester to devise means of interpreting the child's responses. *Although these cases are not numerous they present a very real problem to the psychologist dealing with cerebral palsied children.* Thus with Jill, an attractive little athetoid girl of five years eight months, speech was practically confined to whispered or half-whispered monosyllables. She held a pencil with great difficulty, and had to have her hand guided both for writing and for pointing to her choice of items presented. However, despite these disadvantages, her mind was so alert that there seemed little doubt about her innate intellectual ability. In closely observing the movement of her eyes while I held her wrist firmly to guide her hand for pointing I noticed that when her eyes rested on the item she was seeking there was an involuntary muscular response in the wrist and a pleased smile spread over her face as she was helped to indicate the choice of the item. There was no hesitation or uncertainty. As it was impossible to test repetition of digits or sentences, the alternative tests were taken in their places.

In this way it was possible to get an estimate of this severely handicapped child's intelligence, an estimate which gained her a place in the Carlson House School for Spastics, where the staff are unanimous in their opinion that her response to teaching and treatment confirms the original assessment of normal intelligence.

Severe Physical Disability plus Acute Sensory Impairment

Hearing Loss. Where hearing loss is severe it is advisable for cerebral palsied children to be given an intelligence test by a psychologist experienced in dealing with deaf and partially deaf children. Marked hearing loss in the cases examined during this research was rare, but there was a proportion of children who were known to have partial hearing loss and others in whom it had not previously been noted.

During the check-up of all cases at Carlson House the facts shown in Table III were revealed.

TABLE III

Hearing Loss observed on Admission to Carlson House School for Spastics and after a Specialist's Examination

N = 20

Hearing loss observed on admission	No.	Hearing loss observed after specialist's examination	No.
None	18	None	13
Slight	1	Slight	2
Moderate	1	Moderate	5
Severe	–	Severe	–

An analysis of the cases exhibiting hearing loss showed:

2 spastics with slight hearing loss not previously noted,
3 spastics with moderate hearing loss not previously noted,
1 athetoid with moderate hearing loss previously considered slight,
1 athetoid with moderate hearing loss previously recognised as such.

These results testify to the need for a careful audiometric examination of cerebral palsied children before giving definite assessments of intelligence. Moreover, it accentuates the need for a careful analysis of the intelligence test results to determine the type of test causing failure.

Defective Sight. Defective sight was much more prevalent among our research cases than defective hearing and here again the problem was greater than was at first apparent. Of the first twenty children admitted to Carlson House eight were reported to have defective sight when first seen, but after the testing by the eye specialist this number was increased to ten. Moreover, several of the children were discovered to have a more serious impairment than had been previously realised.

THE ESTIMATED I.Q.

In the majority of cases the estimated I.Q. was the same as the tested I.Q. and/or the modified I.Q., but when the psychologist thought that this was not a correct estimate of the child's intelligence she gave an estimated I.Q. which was based on several or many considerations, according to the nature of the individual case.

For example, Jack was a little boy very severely handicapped, being unable to sit without support or to hold his head erect. His eyes wandered continually in a rolling fashion and his hands were very severely incapacitated. He could not attempt the manipulative items of the test nor those requiring normal vision. His age was six years eight months, his mental age on the Terman Merrill Test was three years nine months and his tested I.Q. 56.

When one realised, however, that Jack had passed such tests as the Materials, Opposite Analogies and Repetition of Four Digits at the four and a half year level, Definitions at the five year level and Vocabulary at the eight year level, one did not feel that an I.Q. of 56 (M.A. 3 years 9 months) was truly representative of the case.

After a careful scrutiny of the test responses it was estimated that his I.Q. was probably *at least 70+* and this figure was suggested as his minimal *estimated I.Q.*

As the first Carlson House group was an experimental group Jack was included in the first admissions. His intelligence was re-tested twelve months later, when his age was seven years eight months, his mental age five years nine months and his tested I.Q. 75.

An analysis of the test result showed that, as Jack gets older and the test items for his age become increasingly dependent on reasoning and memory and less influenced by sight and manipulative ability, the better score does he make. At the next annual testing Jack's tested I.Q. was 81, which was probably still an underestimate.

In the investigation the estimated I.Q. was based on a rational consideration of vital influences of the type discussed above. For example, it could safely be said that a certain child's intelligence quotient was *at least 89*. Sometimes the actual I.Q. would be somewhat higher, as in the case of a child whose test score was adversely affected by lack of experience at school or one who failed on verbal tests owing to difficulties of speech. In this research we felt it necessary to present the picture as we saw it, and since there is always danger in estimating what improvement 'might be made' under certain circumstances, we decided that our estimates of intelligence should be made with caution. Hence the estimates given herein as *basic* figures may be accepted with some confidence.

COMPARISON OF THE TESTED, MODIFIED AND ESTIMATED I.Q.S OBTAINED

The conservative nature of the modified and estimated I.Q.s is indicated in Table IV.

TABLE IV

Number and Percentage of Cases of Cerebral Palsied Children where Estimated I.Q. Differed from Tested and/or Modified I.Q.

	No.	Percentage
Difference of 1 or 2 points of I.Q.	43	13
Difference of 3 points of I.Q.	6	2
Difference of more than 3 points of I.Q.	38	11
Total	87	26

Three-quarters of the whole sample (253 cases: 74 per cent) have identical I.Q. levels—tested, modified and estimated. With these children the test was administered and scored with strict adherence to the usual procedure. Of the eighty-seven cases where there is some discrepancy between the I.Q.s, thirty-eight differ in more than three points, while the remainder show a very small or negligible variation. A further point of interest concerns the type of cerebral palsy case which may require modification of administration or scoring when using the Terman Merrill. Table V gives the numbers of cases of each form of cerebral palsy where modifications were used to obtain the estimated I.Q. and shows what percentage these numbers are of all cases in the survey characterised by the same form of cerebral palsy.

TABLE V

Number and Percentage of Cases for Various Forms of Cerebral Palsy requiring Modification of Usual Terman Merrill Test Procedure

Form of C.P.	No.	Percentage of all cases of this form in survey
Spastics	59	21
Athetoids	17	41
Ataxics	1	25
Mixed (spastic and athetoid)	10	56
	87	

It will be noted that the percentage of athetoids requiring modification of procedure (41 per cent) is much greater than those in either of the other pure forms of cerebral palsy, and that the percentage is even higher (56 per cent) where the children were of a mixed type, having athetosis and spasticity.

It is in these groups of athetoids and mixed types (athetosis and spasticity) that we find the greatest discrepancies between estimated and tested I.Q.s.

While the average difference for the eighty-seven cases is only 2·7 points of I.Q., in six cases the estimated I.Q. is higher than the tested I.Q. by 14, 12, 10, 9, 9, 9 points respectively. On investigating these individual cases we find that all were very severely handicapped children; two (one athetoid and one spastic) were under five years of age with hardly any speech; one was a spastic in hospital recovering from poliomyelitis; two were athetoids, and one a mixed athetoid and spastic whose sight was seriously impaired (Jack, to whom previous reference has been made).

Finally we may refer to the fact that eleven of the twenty children admitted to Carlson House were in this group whose estimated I.Q.s were higher than their tested I.Q.s. Table VI gives details of their I.Q.s on the initial test and at intervals of twelve months thereafter.

TABLE VI

Tested, Modified and Estimated I.Q.s of Twenty Carlson House Children on the Initial Terman Merrill Test, and Estimated I.Q.s on Re-tests at Intervals of Twelve Months

Case	Age	I.Q. on 1st test			1st re-test	2nd re-test	3rd re-test	Degree of disability
		Tested	*Mod.*	*Est.*	Est. I.Q.			
Ken	4·11		76		68	73		severe
Oscar	11·4		85		85	84		moderate
Ernes	6·8		98		100	103	106	moderate
Ron t	6·1		90+		91+	98	97	severe
Peggy	5·11		73		71	80		moderate
Betty	6·8		100		126			slight
Elsie	6·9		106		99			moderate
Rita	7·10		81		74	85		severe
Carol	5·2		98		97	113	112	moderate
Brian	9·5	110	112	112+	133	130	128	severe
Jack	6·8	56	56	70+	75+	81		severe
Tilly	7·8	85	85	90+	96	100	90+	moderate
Kate	5·0	78	80	80+	97	93	88	severe
Brenda	5·7	88	88	90	90	89	86	severe
Katherine	10·2	65	66	70+	84	77+		severe
Nancy	5·7	91	91	95	96	97	91	moderate
Sam	6·8	64	65	70	68			moderate
Jill	5·8	97	103	103	88	99		severe
Edward	11·1	78	78	80	77	84		moderate
Mary	6·7	83	87	87	80	75		moderate

An examination of the test results for the twenty children admitted to Carlson House revealed that in nine cases the estimated I.Q. was the same as the tested I.Q. and for the other eleven cases the estimated I.Q. was higher than the tested I.Q. If we compare these estimated I.Q.s with the I.Q.s from the re-tests given at intervals of twelve months we can arrive at some kind of judgment as to whether the original increase of tested I.Q. was justified.

Of the eleven cases where tested I.Q. was increased to get the estimated I.Q. the re-test showed that this increase was justified in eight cases, partially justified in two cases and not justified in one case.

CORRELATION BETWEEN FIRST AND SECOND TESTING WITH TERMAN MERRILL SCALE

Two estimates of test—re-test reliability for the Terman Merrill used with children of this type were obtained in Birmingham. The first was based upon children selected for special educational provision and derived from the Carlson House group of twenty, and the second upon the whole group of twenty-nine. The re-test was given after an interval of twelve months. The results of these are given in Table VII showing correlations of ·79 and ·89 respectively.

Two things seem to be apparent from these figures. First, it is clear that, whichever group we consider, the reliability coefficient of the test is not significantly lower than that obtained with normal groups. The usual coefficient obtained with normal children of equivalent age range and with a similar interval between tests is of the order of ·8.[1]

It also seems that the total group in its dispersion on the first testing approximates more nearly to a normal group than does the more narrowly selected Carlson House group, and it is of interest to note that in this, the obtained coefficient is considerably higher.

We are entitled to assume, even from this relatively small sample, that in the hands of a competent tester the Stanford Binet test is a reliable instrument for use with cerebral palsied children.

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[1] For a summary of evidence of I.Q. re-test results see *Review of Educ. Research*, Vol. 11, No. 1, February 1941, pp. 11-15; Vol. 14, No. 3, 1944, p. 217; Vol. 17, No. 1, February 1947, pp. 19-22.

Such a degree of reliability, however, is not incompatible with considerable variations for some individuals in tested I.Q., and since the test can be accepted as a measure of the function, any observed changes can most probably be attributed to fluctuations in the subject himself.

TABLE VII

Correlation between Results from First and Second Applications of the Terman Merrill Intelligence Scale to Cerebral Palsied Children, aged Five to Eleven Years

Group		No.	Mean	Standard[1] Deviation	Correlation*
Carlson House	1st Test	20	87·7	12·69	+·793
Carlson House	2nd Test	20	89·8	17·09	
Whole	1st Test	29	80·9	15·73	+·892
Whole	2nd Test	29	81·9	19·39	

* Values of r in excess of ·5 are significant at the ·01 level (Garrett, Table 49)[2]

[1] The higher variability on the second testing in both groups is of interest. Few changes are observed in the tested I.Q.s of the non-Carlson House group (none greater than 6 points), and the main increase in the dispersion appears to come from a few cases in the C.H. group where the discrepancy is 10 points or more. These cases are discussed individually below.

[2] H. E. Garrett, *Statistics in Psychology and Education* (Longmans Green, 1947)

Thus although there was no significant increase or decrease in the mean I.Q.s of the group tested, there were certain cases among the testees where a significant difference in the I.Q.s on the two tests was noted. Three of these cases were so marked as to warrant special enquiry.

Brian was a badly handicapped athetoid boy of 9½ who was at a residential school for cerebral palsied children. His report from this school gave his I.Q. as 106 and stated that although making some progress both in treatment and in school work, his improvement was not commensurate with that expected from one of his intellectual level; his attitude was described as 'hypochondriacal'.

During our survey Brian, whose home is in the Midlands, was tested and his basic I.Q. assessed at 112 (with a note to the effect that this was probably an underestimate). As Brian appeared to be unhappy living away from his parents and young sister, he was admitted to Carlson House (a day school) in January 1949. Four months later (twelve months after the original test) he was re-tested and his I.Q. recorded as 133. His reports from therapists and teachers were of continuous improvement and he was considered as one of the brightest, happiest children in the school. His I.Q. estimates for the following three years were 130, 128 and 127.

In this case there seems little doubt that the result of the original testing was adversely affected by the emotional tension under which the boy was labouring at that time.

Betty was a slightly handicapped spastic girl of 6½ (I.Q. recorded as 100) who was attending a school for physically handicapped children. The range of intelligence within her class was very wide and it seems likely that, despite the teacher's excellent efforts to provide experience for the class as a whole, Betty was not getting the intellectual stimulus she needed. When re-tested with the Stanford Binet Test eight months after entering Carlson House (twelve months after the original intelligence test) her I.Q. was recorded as 126. After twelve months at the school her attainments were so satisfactory that she was transferred to an ordinary school, from which she passed the grammar school entrance examination.

Jill was a very severely handicapped athetoid of nearly six years of age. Her original testing was extremely difficult owing to the fact that she could say only a few monosyllables and could not use her hands. However, her recorded responses, together with her general reactions to stimuli, led to the conclusion that her I.Q. was approximately 103. Jill was admitted to Carlson House nine months later and was prescribed a period of relaxation entailing an almost complete lack of overt response in school. At the end of three months she was re-tested with the Stanford Binet Scale and her I.Q. was recorded as approximately 88, her responses on the re-test being almost identical with those on the original test. A possible explanation of this result may be that she found it difficult suddenly to respond overtly to stimuli after three months of almost total physical inactivity, and hence had not applied herself to the testing situation.

Jill was again re-tested after a further period of twelve months, during which time she had gradually been allowed to participate more and more in the mental life of the class and had actually begun to read. The test results confirmed the original estimate of average intelligence. At this testing Jill's attitude and responses were indicative of a keen intelligence which functioned effectively in spite of the multiple physical handicaps which beset her. The situation was very similar to that of the original testing and there was no trace of the lethargic, slow-thinking testee of the second test interview.

These facts seem to confirm the suggestion that the low I.Q. recorded from the second test may have been due to a temporary condition produced by the enforcement of the utmost possible relaxation. It may be well to add that the physiotherapy methods used have proved most satisfactory. Jill shows less tension and she can now stand alone without sign of the previous scissor gait.

TABLE VIII

Correlation between Results from First and Second Applications of the Terman Merrill Intelligence Scale to Fifty Cerebral Palsied Children at the Queensland Spastic Centre

	No.	Mean	Standard Deviation	Correlation
1st Test	50	78·6	20·8	+·96
2nd Test	50	78·5	20·7	

The foregoing description of cases emphasises the need to repeat psychological tests at twelve-monthly intervals in order to confirm or revise estimated levels of intelligence. At the Queensland Spastic Centre in Brisbane the children are re-tested with the Terman Merrill Scale each year in order to check original estimates of intelligence. Table VIII gives the reliability of the test—re-test for the first fifty children re-tested (*i.e.* not children specially selected for re-testing).

From Table VIII it will be seen that the correlation between the first and second testing with the Terman Merrill Scale was ·96 (error ·011). This result adds confirmation to the findings of the Birmingham research and indicates that testing of cerebral palsied children with this test is, generally speaking, reliable. With the less severely handicapped the intelligence test can be relied on to give a reasonably correct estimate of intellectual level.

If, however, we examine Table VI, showing yearly re-tests of the Carlson House pupils, and Table IX, giving similar Brisbane results, it will be seen that in certain cases the intelligence quotient fluctuates—sometimes to a considerable extent.

In testing severely handicapped children it is to be expected that intelligence test results will be less reliable than with normally equipped children, and this is particularly so with children whose speech and/or hand co-ordination are severely affected. Not only do these handicaps tend to influence the actual *evaluation* of responses, but the responses themselves may also vary with the emotional state of the testee, for it is now universally acknowledged that emotional tension in the cerebral palsied causes deterioration in the functions of speech and physical orientation. This fact was amply illustrated in the above results of the research done at Birmingham and also at the Queensland Spastic Centre.

Handicaps of a severe nature may cause fluctuations in intellectual output over and above the degree attributable to chance. Hence it is unwise when testing such cases to be too emphatic concerning their intellectual level. Moreover, this observation emphasises the previously mentioned need in this work to have psychologists skilled in testing children with physical disabilities.

Finally, as suggested earlier, each child should be considered as an individual in his environment and should be given the fullest chance to develop latent powers as well as obvious abilities. If this is kept in mind the psychologist can use his tests with the utmost advantage to the child and his teacher.

A word of warning, however, should be added for psychologists and administrators selecting children for special cerebral palsied schools. From my experience over the past eight years in England and Australia I would suggest that, when being tested for admission to a school, children should always be given the benefit of the doubt in borderline cases. Moreover, I believe all children whose I.Q.s are estimated at 70 or over should be given an opportunity of special schooling to enable them to prove whether they can benefit from the advantages

TABLE IX

I.Q.s of Fifty Children at Queensland Spastic Centre on the Initial Terman Merrill Intelligence Scale and on Re-tests at Intervals of Twelve Months

	Boys				Girls		
Case	Initial test	1st re-test	2nd re-test	Case	Initial test	1st re-test	2nd re-test
1	85	81		27	71	67	
2	84	86	78	28	83	82	
3	65	57		29	69	61	
4	100	120		30	88	104	
5	106	99	96	31	66	65	
6	91	103		32	62	69	
7	69	62	58	33	82	77	
8	95	113		34	75	75	75
9	88	88	88	35	90	97	102
10	75	73		36	71	63	57
11	85	86	87	37	95	100	113
12	78	89	75	38	114	100	122
13	61	56		39	70	67	61
14	38	40		40	56	53	56
15	123	110	120	41	37	40	
16	43	46	41	42	100	100	120
17	60	58	50	43	108	103	
18	108	116		44	55	55	57
19	89	86		45	63	56	
20	95	100	92	46	72	69	
21	100	87		47	48	50	
22	69	70		48	41	48	
23	89	80		49	115	101	
24	96	96		50	67	68	
25	72	89					
26	50	46					

offered therein. It would seem likely that the practice, adopted in some centres, of excluding all children whose initial tested I.Q. is below 80 may result in a certain number of intelligent cerebral palsied children being deprived of schooling.

CHAPTER VII

ARE THEY INTELLIGENT?

In the Birmingham research our figures for incidence related initially to 400 cases of cerebral palsy, under the age of sixteen years, who were given medical examinations. Of these all except the young babies were brought for psychological interview.

As has been explained above, the research aimed at including all children suffering from cerebral palsy whose homes were in the West Midland counties. In no instance was there any selection made according to the type of case or any other factor. Hence we believe this sample of cerebral palsied children to be a representative one, with two possible exceptions of a minor kind; a small percentage of the very badly handicapped of low grade intelligence may have been missed, and almost certainly some of those of normal or supernormal intelligence, whose physical disability was so slight as to be passed over without special comment, may not have been included.

CASES UNDER THE AGE OF THREE YEARS

Although the writer tested a proportion of the cases under three years of age, it was decided not to include any of these results. Cerebral palsied children tend to be retarded in physical development as compared with normal children and as the young child's mental development is very closely bound up with experiences gained by using his limbs and his sensory powers, it is possible that the child whose physical and sensory experiences are unduly limited may, to some extent, reflect these disadvantages in objective measures of his intelligence.

Moreover, while certain tests have been prepared for estimating the intellectual development of very young children, they are based largely on physical development and so it was not considered satisfactory to use these for cerebral palsied children under three years of age except in a small proportion of cases where the physical handicap was not severe.

Experience throughout the survey tended to confirm our original policy of caution in forming definite estimates of intelligence for young severely handicapped cerebral palsied children and for most of those who had not yet reached their third birthday. This explains why eight of the children whose intelligence is 'not yet assessable' are found in the three- and four-year-old groups.

There was a number of cases where early history had suggested that the child would be mentally defective, and indeed a few who had actually been certified as such but who in fact later proved to be of normal or slightly subnormal intelligence. In such cases, not only do the parents suffer unnecessary anxiety but often the children are deprived of full opportunity to develop latent powers because it is considered a waste of time to enrich their restricted environment.

This does not mean that the intelligence of every young cerebral palsied child cannot be assessed. Indeed some respond very well to the usual tests, while others, by the nature and degree of their response to certain stimuli, give an indication of their *probable* future mental development.

But as these estimates of the intelligence of children under three years can only be approximations, it was considered advisable to confine the psychological data of this research to 354 children between the ages of three and fifteen+ years. Of these 193 were boys and 161 girls.

DISTRIBUTION OF INTELLIGENCE

Table X[1] sets out the numbers and percentages of boys and girls in the research group at each of the I.Q. levels from below 25 to above 130. The same information is presented in graphical form in Figure 1, from which it is observed that the distributions of intelligence for the boys and for the girls are very similar.[2]

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[1] The fourteen children for whom it was not possible to obtain assessments are included in this table.

[2] $P = \cdot 98$

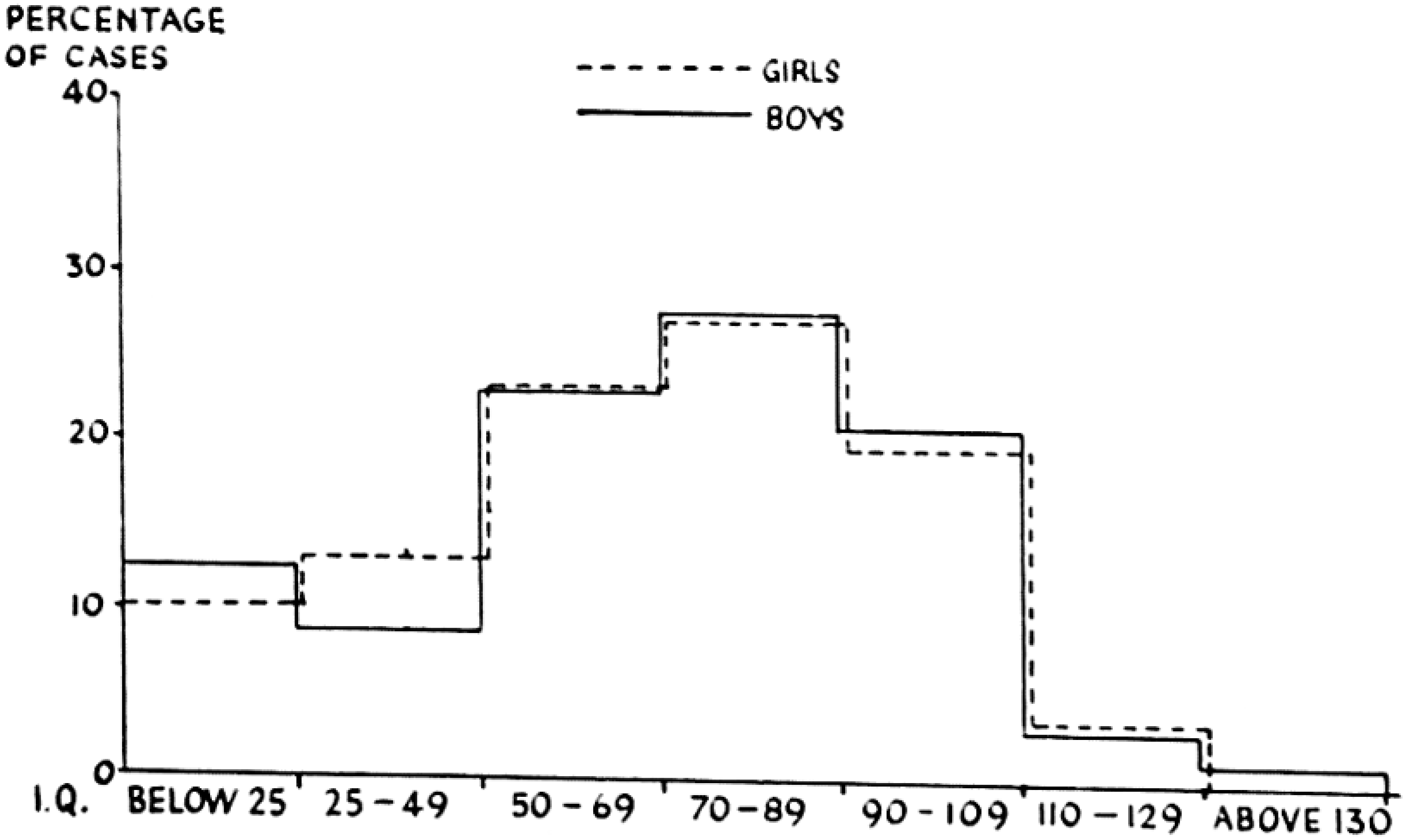
TABLE X

Distribution of Estimated I.Q.s of 193 Boys and 161 Girls of the Cerebral Palsy Group

I.Q. level	Boys		Girls		Total	
	No.	%	No.	%	No.	%
130+	2	1·0	—	—	2	·6
110-129	6	3·0	6	3·7	12	3·4
90-109	40	20·7	31	19·3	71	20·1
70-89	52	27·0	43	26·7	95	26·8
50-69	44	22·8	37	23·0	81	22·9
25-49	17	8·8	21	13·0	38	10·7
Below 25	24	12·5	17	10·6	41	11·6
Not yet assessable	8	4·2	6	3·7	14	3·9
	193	100	161	100	354	100

FIGURE I

Distribution of estimated I.Q.s of 193 boys and 161 girls in the cerebral palsy group



I.Q. NOT YET ASSESSABLE GIRLS 3·7%
BOYS 4·2%

Figure 2 emphasises the difference of distribution of intelligence between the cerebral palsy and normal groups, the numbers for each group at the various intelligence levels being shown in Table XI.[1]

TABLE XI

Distribution of 354 Estimated I.Q.s of Cerebral Palsy Group compared with Normal Child Population

I.Q. level	No. of cases	% of group	% in normal[2] population $\sigma = 16$	Usual nomenclature	Suitable provision	
130+	2	·6	3	super-normal	ordinary school	educable
110-129	12	3·4	24			
90-109	71	20·1	46	normal		
70-89	95	26·8	24	dull		
50-69	81	22·9	3	feeble-minded or moron	special school for E.S.N. or occupation centre	
25-49	38	10·7				ineducable
Below 25	41	11·6		idiot	institution	
Not yet assessable	14	3·9				

An examination of the figures discloses the fact that in the cerebral palsy group 51 per cent have intelligence comparable with pupils in the ordinary schools, while another 23 per cent have mentality sufficiently high to enable them, apart from their physical disability, to be educated in a school for educationally subnormal children. *Thus five out of every ten cerebral palsied children are of dull, normal or above normal intelligence*, a finding of extreme importance to parents and educators and one that should convince public opinion that there are many cerebral palsied children on whom it is worth spending extra money for special education.

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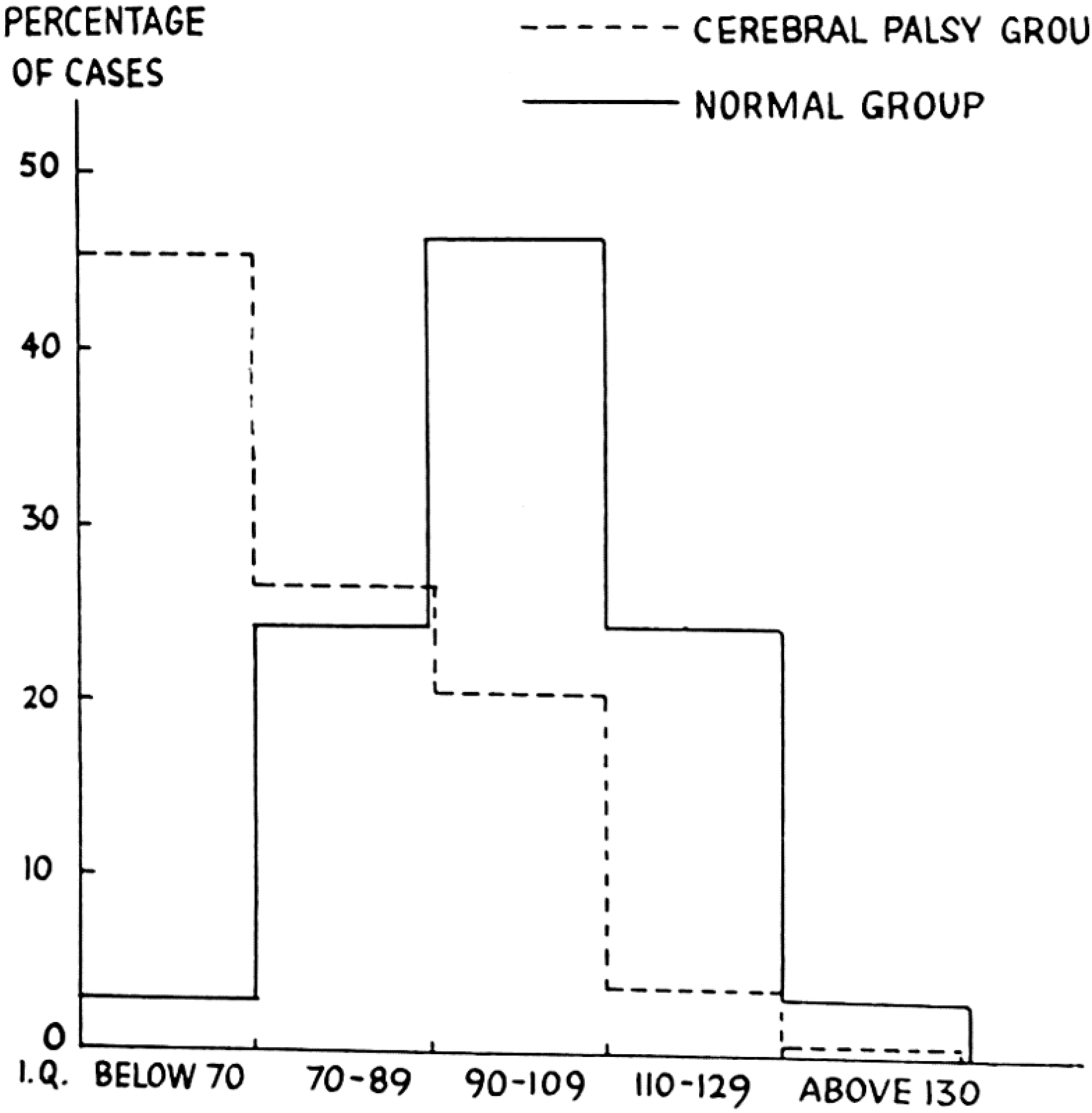
[1] As explained in Chapter VI, these are *basic* I.Q.s and therefore the actual I.Q.s are likely to be somewhat higher for a proportion of the more severely handicapped children.

[2] See F. J. Schonell in Development of Educational Research, *Brit. J. of Educ. Psy.*, Vols. 18, Part I, February 1948, and 19, Part II, June 1949. These estimates are based on the findings of Burt, Thomson, Lewis and the Scottish Educational Research Council.

FIGURE 2

Distribution of 354 estimated I.Q.s of cerebral palsy group compared with distribution of I.Q.s in normal child population



3.9% I.Q. NOT YET ASSESSABLE

While a few cerebral palsied children are very intelligent, the group of normal and supernormal intelligence as a whole forms only 24 per cent of the cases as against 73 per cent in the normal population. Conversely, at the bottom end of the intelligence scale, 45 per cent of the cerebral palsy group have markedly lowered intelligence while about 3 to 5 per cent of the ordinary population are in this category.

While the research results show that we can do much more for the 50 per cent of intelligent cerebral palsied children, they also indicate that an equal number have not the intelligence to profit from special educational opportunities of a scholastic kind.

It is of interest to compare the distribution of intelligence in the Birmingham survey with that obtained from the first 172 cerebral palsied children tested (with the Terman Merrill Intelligence Scale by two psychologists) at the Spastic Centre in Brisbane, Queensland, Australia, between 1950 and 1953. The results of the investigation, which revealed a similar distribution of intelligence for the eighty-eight boys and eighty-four girls, are given in Table XII.

TABLE XII

Distribution of 172 Estimated I.Q.s of Cerebral Palsied Children seen at the Queensland Spastic Centre

	Boys		Girls		Total	
I.Q. level	No.	Percentage	No.	Percentage	No.	Percentage
130+	—	—	—	—	—	—
110-129	3	3·4	2	2·4	5	2·9
90-109	20	22·7	15	17·8	35	20·4
70-89	24	27·3	25	29·8	49	28·5
50-69	21	23·9	22	26·2	43	25·0
Below 50	14	15·9	14	16·7	28	16·3
Not yet assessable	6	6·8	6	7·1	12	6·9
Total	88	100	84	100	172	100

Although the table for the Brisbane children gives a smaller number in the above-average group, 2·9 per cent as against 4 per cent in the Birmingham survey, yet the general pattern of the two results is very similar. The whole group of normals and supernormals is 23·3 per cent for Brisbane and 24·1 per cent for Birmingham; the dull groupings are Brisbane 28·5 per cent and Birmingham 26·8 per cent; the feeble-minded numbers are 25 per cent and 22·9 per cent respectively and the figures for those of low grade intelligence are 16·3 per cent as against 22·3 per cent. Almost twice as many in Brisbane (6·9 per cent) as in Birmingham (3·9 per cent) were not assessable.

Thus we find that, although the Queensland survey does not claim to have covered the field as thoroughly as the Birmingham investigation did, the results confirm in general terms the results of the earlier investigation. Whereas 50·9 per cent of the English cerebral palsied children were of dull, normal or supernormal intelligence, 51·8 per cent of the Australian cases came into this category of children capable of ordinary education, within the limits of their handicaps.

Again, while 22·9 per cent of the English cases were sufficiently intelligent to be trained in less academic tasks, 25 per cent of the Australian cases were of this mental level.

In considering these results from English and Australian children it is interesting to refer to certain American findings on the distribution of intelligence amongst the cerebral palsied. McIntire,[1] working with Phelps, analysed the estimates of intelligence for the first five hundred cases seen in various clinics in the New Jersey survey and gave the following figures:

10·2 per cent, diagnosis had to be deferred
4·0 per cent, superior intelligence
41·4 per cent, average
11·0 per cent, dull
5·8 per cent, borderline
27·6 per cent, feeble-minded.

This, the only large-scale survey reported when the Birmingham research was undertaken (1947-48), gave a considerably lower percentage in the feeble-minded group than we found in our investigation. But since then reports[2] from both England and America have tended to confirm that a greater proportion of cerebral palsied children are mentally defective than was thought to be the case by early research workers.

[1] See J. T. McIntire, The Incidence of Feeble-Mindedness in the Cerebral Palsied, *Proceedings of the American Association on Mental Deficiency*, 1938, Vol. 43, pp. 44-50, and 1946, Vol. 50, pp. 491-94.

[2] See M. I. Dunsdon, *The Educability of Cerebral Palsied Children*, 1952, p. 22, and John F. Pohl, *Cerebral Palsy* (Bruce Publishing Co, Saint Paul, Minnesota, 1950, p. 24).

CHAPTER VIII

RELATION BETWEEN INTELLIGENCE AND PHYSICAL HANDICAP

BECAUSE it was formerly a common belief that most cerebral palsied children were mentally inferior, particularly the athetoid, the severely handicapped and those with very defective speech, little was done to help them. Dr Perlstein has said, 'The blame for neglect, past and present, rests to a great extent on the doctor's doorstep. In general, most doctors are still abysmally ignorant concerning the nature of cerebral palsy and are unaware that most of the afflicted can be helped to a rewarding degree.'[1]

A considerable number of the severe cases seen during this survey had histories of visits to doctors, none of whom had held out hope for physical and/or mental improvement in these young children. When parents explained that their child gave indications of intelligence by certain reactions, they were usually waved aside with good-natured incredulity without any attempt to investigate the real nature and level of the child's mental response.

To this were added the attitudes of other professional and lay people, some of whom barely veiled their feelings of curiosity or revulsion at the sight of the child disfigured and deformed by cerebral palsy. What wonder that many of the parents of such children tended to keep them socially isolated, either with or without some attempt to cultivate their mental powers. It takes great courage and conviction to act contrary to public opinion—especially opinion substantiated by professional diagnosis—even when one believes in the evidence of one's own observations.

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[1] M. A. Perlstein, *The Problem of Cerebral Palsy Today* (Association for the Aid of Crippled Children, New York, 1947). Similar references are to be found in other journals.

Then when the work of American doctors began to suggest that some of these severely handicapped children were not mentally defective after all, a decided reversal of public opinion took place. Much publicity was given to certain cases formerly considered hopeless but now given a good prognosis and it was assumed, without foundation, that the percentage of mental defect among cerebral palsied cases was small. As a result, the parents of all cerebral palsied children began to hope that their children were normally intelligent.

TYPE OF CEREBRAL PALSY

The type of child who was causing the most surprise with regard to his mental powers was the athetoid, who had previously been almost unanimously acknowledged as mentally deficient. As some of these children had been proved to be of normal intelligence, although very severely handicapped and with little or no speech, the assumption grew that athetoids were necessarily intelligent.

Following the opinion of Phelps and others working in the field, it became generally accepted that athetoids as a class were of superior intelligence to spastics and, indeed, the diagnosis of athetosis became more or less a testimonial of normal intelligence. Such is the flavour of all recent writings and addresses on the subject both in England and abroad.

To substantiate this conclusion there was available no actual research data from a large-scale unselected group of cases.

In England, Evans[1] has said that less than 10 per cent of the athetoids and over 60 per cent of the spastics at Carshalton were found to be ineducable. In discussing the composition of a group of cases he describes them as:

25 educable athetoids,	2 ineducable athetoids,
7 educable spastics,	13 ineducable spastics.

From such a small group as this, taken from a wide area, it is, however, unsound to draw general conclusions, especially when the majority of the cases are very young children for whom estimates of intelligence can only be tentative.

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[1] E. Stanley Evans, Cerebral Palsy, *Proceedings of the Royal Society of Medicine*, Vol. 39, No. 6, April 1946, pp. 317-20

Present Evidence

In the light of the above it is interesting to note the distribution of mean estimated I.Q.s according to form of cerebral palsy, for the 340 cases in the survey.

Table XIII shows the mean estimated I.Q.s of 277 spastics, forty-one athetoids, four ataxics and eighteen cases of mixed type. The mean I.Q.s vary but little with the different types of cerebral palsy, the greatest difference being 5-6 points between the spastics and the ataxics. The differences are not statistically significant.[1]

TABLE XIII

Mean Estimated I.Q.s of 340 Children grouped according to Form of Cerebral Palsy

	Spastic	Athetoid	Ataxic	Mixed	Total
Mean I.Q.	67·9	67·6	62·3	62·4	
S.D.	27·7	25·5	19·3	21·5	
N.	277	41	4	18	340
Not yet assessable	9	4	—	1	14
Total	286	45	4	19	354

Disregarding the ataxics, for whom the numbers are too small, *we may assume that in the sample of cerebral palsied cases examined in the survey there is no significant difference between the mean I.Q.s of the groups characterised by different forms of the handicap.*[2]

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[1] In all these tables the significance of the difference of means has been tested by the 't' test (R. A. Fisher *Statistical Methods for Research Workers*, pp. 116-17). All differences regarded as significant reach or exceed the ·05 level of confidence and in most cases the ·02 level.

[2] Since this was written research workers are beginning to report similar conclusions from studies in America and England. See John F. Pohl, *Cerebral Palsy*, p. 25, where the author, investigating 144 cerebral palsied children, states: 'No striking difference in intelligence is found between children with the spastic and athetotic types of cerebral palsy. The average level of intelligence is slightly higher in those with the athetotic type of case than in the spastic, but children of superior as well as inferior mentality are found in both types of case.' See also Bessie Burgemeister and Lucille H. Blum, Intellectual Evaluation of a Group of Cerebral Palsied Children, *The Nervous Child*, Vol. 8, No. 2, April 1949, and M. I. Dunsdon, *The Educability of Cerebral Palsied Children.*

Table XIV gives a further analysis of part of Table XIII, Column 1. The pure spastics have been grouped according to the *type* of spastic paralysis[1] and Table XIV shows the mean estimated I.Q.s of forty-one left hemiplegics, fifty-seven right hemiplegics, eighty-five paraplegics and eighty quadriplegics.

TABLE XIV

*Mean Estimated I.Q.s of 263 Children grouped according to Various Categories of Spastic Paralysis**

	Left Hem.	Right Hem.	Para.	Quad.	Total
Mean I.Q.	77·9	76·8	74·3	50·2	
S.D.	20·1	26·0	23·6	27·6	
N.	41	57	85	80	263
Not yet assessable	1	2	2	4	9
Total N.	42	59	87	84	272

* This table is confined to pure spastics as most athetoids have all limbs affected to some degree.

While there are no statistically significant differences in mean I.Q. between the two kinds of hemiplegics and the paraplegics, there is evident in the table a decline from hemiplegics to paraplegics, and the group of quadriplegics is markedly, and significantly, lower still. It is possible that this decline indicates successively more severe impairment of those areas of the cortex more specifically associated with intellectual functioning and that, as cortical damage is widespread in the quadriplegics, there is a correspondingly greater loss of potential intellectual power. If such were the case it should help to account for the large proportion of children with very low intelligence in the quadriplegic group.

DEGREE OF PHYSICAL HANDICAP

For each child seen by the psychologist details were noted concerning his degree of physical disability. Every child had some physical handicap. The severity of the handicap is here interpreted in relation to the degree to which it interferes with the child's capacity to enter into normal life experiences. Thus the following schedule of grading was employed:

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[1] Monoplegics and triplegics are omitted as they were too few in number to be of statistical interest.

A. *Slight handicap.* A slight handicap is one that does not greatly restrict movements of limbs or use of sensory powers, *e.g.* a child with a slight limp or with a minor defect of sight and one hand or leg mildly affected.

B. *Moderate handicap.* The moderately handicapped child has marked physical disabilities which limit, to a certain extent, the effectiveness of his contacts with his environment, *e.g.* he may have one or both legs so severely affected that he cannot walk alone unsupported, or he may have a severe hemiplegia which restricts his mobility and also his manipulation of material, thus limiting the quality of his experiences.

C. *Severe handicap.* The severely handicapped child is one with multiple handicaps, usually both physical and sensory, *e.g.* all in this group were unable to walk unsupported and therefore were confined to a chair. In addition, the majority had severe disability of the hands, speech defects, and sensory defects such as moderate or severe visual and/or hearing loss.

D. *Very severe handicap.* Very severely handicapped refers to the child who is so seriously affected physically that he is confined to bed, *e.g.* this group consists mainly of idiots and imbeciles, in institutions or at home, who have no use of the legs, very little if any ability to use the hands, and who usually cannot sit unsupported. Their reactions to stimuli usually leave no doubt as to their extremely low intelligence. Only one child in this group of very severely handicapped children showed signs of normal intelligence. He was a little boy of five years of age in hospital. He could not use his legs, he could not speak and he had practically no use of his hands, yet from his general reactions to stimuli and to certain selected intelligence test items it was concluded that he probably had almost average intelligence. This opinion[1] was confirmed by the hospital staff, who had been able to compare his reactions over a long period with those of two cerebral palsied girls in the hospital, one of average intelligence (I.Q. 97, aged 5·5 years) and the other of supernormal intelligence (I.Q. 120, aged 4·3 years).

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[1] This boy was subsequently given individual teaching and his progress in reading and number justified the original assumption of normal intelligence.

Table XV gives the mean estimated I.Q.s of 340 cerebral palsied children grouped according to degree of physical disability.

TABLE XV[1]

Mean Estimated I.Q.s of 340 Cerebral Palsied Children grouped according to Degree of Physical Disability

	Slight handicap	Moderate handicap	Severe handicap	Very severe handicap	Total
Mean I.Q.	81·8	71·7	55·6	24·6	
S.D.	19·96	23·74	25·50	16·98	
N.	87	148	85	20	340
Not yet assessable	2	2	8	2	14
Total	89	150	93	22	354

An examination of the figures given in Table XV shows that in this sample of 340 cerebral palsied children there is a significant correspondence between level of intelligence and degree of physical disability. The table shows a constant fall in mean I.Q. from the slightly handicapped group (mean I.Q. 81·8) to the very severely handicapped group (mean I.Q. 24.6). All the differences between these means are statistically significant. *As the physical handicap increases, the tendency is for the mean I.Q. to fall.*[2]

This does not, however, imply that this is so in every individual case. There is considerable overlap between the groups, as can be seen from the wide standard deviations; some of our most intelligent children are in the groups of moderately and severely handicapped, and on the other hand there are a number whose chief handicap is mental impairment, with but the very slightest sign of physical disability.

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[1] In The Rehabilitation of Cerebral Palsy, *J. of the Southern Med. Assn.*, July 1941, Phelps quotes percentages for the various degrees of handicap as: mild 28 per cent, moderate 44·3 per cent, severe 27·7 per cent. Compare our figures, mild 25·6 per cent, moderate 43·5 per cent, severe 30·9 per cent.

[2] W. Elvis Bosley, in Assessment of Intelligence in Cerebral Palsy Cases (*Spastic Review*, September 1945) quotes a study in which degree of crippling and I.Q. were compared. A slight tendency for level of intelligence to decrease as degree of crippling increased was reported. C. A. Patten and R. A. Matthews (*Arch. Neurol. and Psychiat.*, Vol. 34, p. 61, 1935), investigating 350 very severely handicapped children, found that I.Q. tended to vary inversely with the severity of the paralysis. 82·6 per cent of this group had I.Q.s below 50.

CHAPTER IX

READING ABILITIES

EACH child capable of reading was given the Schonell Graded Word Reading Test[1] to ascertain his level of reading attainment

TABLE XVI

Distribution of Reading Attainments in Cerebral Palsy Group N = 354

Classification	Boys		Girls		Total		Grand total
	No.	% of Group	No.	% of Group	No.	% of Group	
Readers							
Reading quotient							
100+	16	23·5	16	35·6	32	28·3	
90+	14	20·6	11	24·4	25	22·1	
80+	14	20·6	9	20·0	23	20·4	
70+	16	23·5	7	15·6	23	20·4	
60+	5	7·4	1	2·2	6	5·3	
50+	2	2·9	1	2·2	3	2·6	
40+	1	1·5	—	—	1	·9	
Total	68		45		113		113
Non-Readers							
Under 7 years old	73	58·4	68	58·6	141	58·5	
Limited mentality (I.Q. under 70)	43	34·4	40	34·5	83	34·5	
I.Q. not assessable	2	1·6	1	·9	3	1·2	
Severe sensory defect (speech, sight and/or hearing)	2	1·6	1	·9	3	1·2	
Others	5	4·0	6	5·1	11	4·6	
Total	125		116		241		241
Grand total							354

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[1] Taken from *The Psychology and Teaching of Reading* by F. J. Schonell, Oliver and Boyd, Edinburgh, 1944

as measured by norms for the general school population. From this his reading age and his reading quotient[1] were obtained. The results are given in Table XVI.

Approximately one-third of the non-readers have I.Q.s under 70, and 58·5 per cent are children under seven years of age. These two groups account for 93 per cent of the non-readers, leaving only 7 per cent in the over seven years old group with I.Q.s over 70.

When we examine the figures for the reading group another seemingly satisfactory situation is found, for 71 per cent of the children have reading quotients of 80 or more. These figures, however, obscure the fact that whereas some older children of mediocre intelligence and slight physical handicap obtain comparatively high reading quotients through the advantage of more years at school, a considerable number of the brighter children, who have had limited or no schooling on account of their physical disabilities, obtain low reading quotients. *They have not had sufficient opportunity to use their intellectual powers to the full.*

This point emerges clearly in Table XVII, which gives the numbers of children with I.Q.s of 70 and over at each of the reading quotient levels from 40+ to 100+.

One would expect that the more intelligent members of the reading group would have higher reading quotients than the less intelligent, but this is not so. Indeed, while only 23 per cent of those with I.Q.s of 90 or over have reading quotients of 100+, 32 per cent of those with I.Q.s of 70-90 have a similar reading quotient. On the other hand, 54 per cent of the more intelligent children and only 34 per cent of the less intelligent have reading quotients of 80-100.

This point is further elucidated from a study of Table XVIII, which gives the numbers of children at each age level over seven years in the I.Q. 90– and I.Q. 90+ groups who have reading quotients of 100+. The table also shows the age distribution of both the reading pupils and the whole group of 206 children over the age of seven.

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[1] Reading quotient $= \frac{\text{Reading Age} \times 100}{\text{Mental Age}}$

i.e. A child whose reading attainments are level with his mental development has a reading quotient of 100.

TABLE XVII

Distribution of Reading Quotients of Cerebral Palsied Children with I.Q.s of 70 and Over who can Read

Reading Quotient	I.Q. under 90		I.Q. 90 and above	
	No.	%	No.	%
100+	21	32	11	23
90+	11	17	14	29
80+	11	17	12	25
70+	14	22	9	19
60+	5	8	1	2
50+	2	3	1	2
40+	1	1	—	—
Total	65		48	

TABLE XVIII[1]

Distribution of 206 Children over the Age of Seven Years who have (a) I.Q.s over 90 and (b) I.Q.s under 90, in the Whole Group and in the Reading Group

Age	I.Q. under 90			I.Q. 90 and above			Total children in groups
	No. in whole group	No. in reading group	No. with R.Q. 100+	No. in whole group	No. in reading group	No. with R.Q. 100+	
7	14	1	—	9	7	1	23
8	13	3	1	3	3	1	16
9	37	11	4	5	5	3	42
10	23	7	2	6	6	1	29
11	26	14	5	8	8	2	34
12	17	6	3	1	1	1	18
13	13	10	4	3	3	1	16
14	8	3	—	5	5	1	13
15	12	10	2	3	3	—	15
Totals	163	65	21	43	41	11	206

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[1] Not shown in this table but included as readers in Table XV are seven six-year-olds who could read. Only two six-year-olds with I.Q.s of 90+ could not read.

Of the 206 over the age of seven, forty-three had I.Q.s of 90 or over, and of these all except two seven-year-olds could read, *i.e.* 95 per cent. Of the 163 children over seven with I.Q.s below 90 only 65 (40 per cent) could read; this is rather what one would expect. But when we examine the table further we find that (*a*) only 28·6 per cent (six out of twenty-one) of the reading children, aged seven to ten years inclusive in the I.Q. 90+ group, have reading quotients of 100+ and (*b*) 31·8 per cent (seven out of twenty-two) of the reading children aged seven to ten years inclusive in the I.Q. 90 − group have similar reading quotients.

Similarly, in the older group aged eleven to fifteen years inclusive only 25 per cent (five out of twenty) of the more intelligent as against 32·6 per cent (fourteen out of forty-three) of the less intelligent readers have reading quotients[1] of 100+.

The tables reflect evidence of unused intellectual power as regards achievement in reading amongst children of I.Q.s 90 *and above.* This was borne out by records of pupils in Carlson House Experimental School. Here some of the brighter children who had been deprived of adequate reading instruction and opportunities showed marked gains in reading attainments[2] under suitable instruction.

Similarly with the younger group: of ten who could not read when they entered the school the quickest and best progress was made by the children with I.Q.s over 90; three of these six-year-olds obtained reading ages of over seven after fifteen months in the school.

Only three children failed to learn to read; one of these pupils had sight so defective that he could not see print of any size and the other two had I.Q.s in the region of 70.

The figures given in this section suggest, and this has been confirmed by our experience, that while under the present educational provision cerebral palsied children of I.Q. 70+ can be taught to read fairly effectively, *the normally intelligent and*

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[1] This problem is not a clear-cut issue because reading attainments are influenced by chronological age as well as by mental age and although the latter is the more important, the reading quotient tends to minimise too much the effects of chronological age.

[2] See Chapter XVI.

very bright cerebral palsied child tends to be given insufficient opportunity and stimulus to develop his abilities beyond mediocre levels.

One of the most intelligent children in the survey, a boy of 15·4 years (I.Q. 131), had a reading age of only 13·2 years. Although this boy had a comparatively slight physical handicap he had attended a special school for physically handicapped children up to the age of fifteen years. He tried for entrance to the technical school but was unsuccessful in spite of strong support from the headmistress, who explained the special difficulties of the cerebral palsied child. Probably if this boy had had the stimulus and opportunities offered in a school where only children of normal and supernormal intelligence were admitted, he would have merited further education beyond the age of fifteen.

RELATION OF READING ATTAINMENTS TO FORM OF CEREBRAL PALSY

Table XIX sets out the mean reading quotients of children with the various forms of cerebral palsy together with the numbers and percentages of non-readers. It will be observed that the average reading quotient of the athetoid who can read

TABLE XIX

Reading Attainments of Children over Seven Years of Age with Different Forms of Cerebral Palsy

N = 213

	Spastic		Athetoid		Ataxic		Mixed		Total
Readers									
Mean Reading Quotient	88·7		94·5		78·0		89·5		
S.D.	15·70		20·46		—		15·00		
	No.	%	No.	%	No.	%	No.	%	
Readers	98	56	12	43	1	50	2	25	
Non-readers	77	44	16	57	1	50	6	75	
Total	175		28		2		8		213

is higher than that of the spastic who can read, the difference approaching the level of statistical significance.[1] On the other hand, 57 per cent of the athetoids over seven years of age cannot read, while only 44 per cent of the spastics are in this category.

TABLE XX

Reading Attainments of Spastics classified according to Type of Spasticity

	Left hemiplegias		Right hemiplegias		Paraplegias		Quadriplegias		Totals
Readers									
Mean Reading Quotient	90·8		88·1		90·2		80·0		
S.D.	12·89		14·14		16·15		15·36		
	No.	%	No.	%	No.	%	No.	%	
Readers	19	73	29	66	36	69	8	19	92
Non-readers	7	27	15	34	16	31	34	81	72
Total	26		44		52		42		164

In Table XX a further analysis is given of the group of spastics from Table XIX. Mean reading quotients are shown for the various forms of spastic paralysis; only true spastics are included and monoplegics and triplegics are omitted as the numbers are too small to be of statistical interest. None of the differences is statistically significant, although the quadriplegics have the lowest mean reading quotient and the greatest proportion of non-readers. This last-mentioned fact is no doubt mainly due to the large proportion of low grade mentally defectives in this group.

READING ATTAINMENT AND DEGREE OF PHYSICAL DISABILITY

The research data were also examined to determine the relationship between reading attainments and degree of physical disability. Table XXI shows the mean reading quotients and the numbers of readers and non-readers in each of the physically handicapped groups—slightly handicapped, moderately handicapped, severely handicapped and very severely handicapped.

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[1] $t = 1\cdot1586$ $P = \cdot12$

TABLE XXI

Reading Attainments of Cerebral Palsied Children with Different Degrees of Physical Disability

Physical disability	Slight handicap		Moderate handicap		Severe handicap		Very severe handicap		Total
	Group A		Group B		Group C		Group D		
Readers									
Mean Reading Quotient	89·7		91·0		80·3		—		
S.D.	16·79		14·68		14·88				
	No.	%	No.	%	No.	%	No.	%	
Readers	47	76	54	61	12	25	—	—	113
Non-readers over 7 years	15	24	34	39	37	75	14	100	100
Totals	62		88		49		14		213

The figures give a clear indication that in the group tested a moderate degree of physical disability had no appreciable detrimental effect on the average reading quotient.

This is a finding of extreme and far-reaching importance in regard to the education of cerebral palsied children for it reveals that many of the less handicapped (Groups A and B), deprived as they are of the ability and opportunity of taking part in all the physical activities of normal children, can and should receive strong compensation by acquiring the valuable skill of reading.[1] This small part of the research established clearly that cerebral palsied pupils with moderate handicap need not be held up in verbal development through their disability, and hence every attempt should be made to provide them with this powerful means of satisfaction and self-education.

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[1] Moodie constantly makes the point that his work in Child Guidance with maladjusted and handicapped children emphasises the intimate relationship between the child's success in basic school subjects and his mental health.

If we now look, on the other hand, at the *severely handicapped cases* (those in Group C), we find that their reading skill is markedly below the reading levels of the other groups. Not only is the mean reading quotient significantly lower, but the percentage of non-readers is considerably greater, 75 per cent as compared with 39 per cent of the moderately handicapped and 24 per cent of the slightly handicapped. There are probably several contributory reasons for this difference between Groups A and B and Group C. In the first place many of the severely handicapped have multiple handicaps, including sensory and speech defects. Secondly, in addition they frequently have hand disability and inco-ordination which has prevented them from using a very strong supplementary means of learning to remember words, namely through their movement or kinaesthetic patterns in writing or tracing. Thirdly, most of these children have had no schooling or have had irregular instruction, owing to their physical condition, which usually necessitates hospital attendance as either in- or out-patients. But of these various causes of lowered level in reading it seems probable that the last, lack of regular instruction, is the most important. For where some of these children had regular teaching for twelve months in the Carlson House School for Spastics surprising improvement in reading was made.

CHAPTER X

THE CEREBRAL PALSIED CHILD AT HOME

IN addition to data on the distribution of intelligence and reading attainments amongst the cerebral palsied children examined, information was also gathered on some of the physical, emotional and social aspects of the problem.[1]

(1) TYPE OF CEREBRAL PALSY AND EDUCABILITY[2]

Thus during the survey careful notes were made of the *type of cerebral palsy* from which each child suffered and the relationship of his physical disability to possible educability.

(2) PHYSICAL DISABILITY[2]

Physical disability was studied in relation to five aspects, namely, general physical condition, mobility, limbs affected, sensory defects and speech defects. Each of these five aspects of the handicap was assessed on a four-point scale, ranging from
'A', denoting a slightly subnormal condition, to
'D', denoting a marked condition of subnormality or handicap.

(3) ECONOMIC STATUS OF PARENTS AND HOME

An attempt was made to assess the socio-economic status of parents and home with a view to revealing the approximate distribution of cerebral palsy amongst various socio-economic groups. Naturally the method used and the figures obtained are only approximations, but in so far as the sample of cerebral palsied cases was drawn from an area including all types of occupations and covering not only large cities but an urban and a considerable rural population as well, the figures should give a fairly accurate picture of the trend of the distribution from group to group. Socio-economic status was assessed in terms of three main groups as outlined below:

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[1] I am indebted particularly to Miss Gurney and Miss Clarke, Head Teachers of two schools for physically handicapped children, and to their respective staff members for their ready co-operation in giving additional information about the C.P. children in their schools.

[2] Information relating to sections (1) and (2) is given in Chapter VIII.

> *Group A* (*superior*) included groups such as professional, higher commercial, managerial, high-level clerical and state or municipal administrative;
> *Group B* (*average*) included groups such as clerical, lesser commercial (*e.g.* small shopkeepers), skilled trades;
> *Group C* (*below average*) included groups such as semi-skilled, labourer, casual labourer.

The figures thus obtained, using the above classification and based on evidence about the children and parents, were as follows:

	No.	%
Group A socio-economic status of home	59	20
Group B ,, ,, ,, ,, ,,	175	58
Group C ,, ,, ,, ,, ,,	67	22

These results indicate clearly that cerebral palsy cases are not confined to any particular socio-economic group but are found distributed throughout all groups, from those of the most favourable to those of the least favourable socio-economic conditions.

The evidence from these figures finds some confirmation in those obtained by two American investigators, McIntire[1] and Odoroff.[2] McIntire tabulated the paternal occupations of 133 cerebral palsied children according to the Minnesota Occupational Intelligence Scale. He compared the father's occupation with a random sample of employed males in the general population and concluded that the cerebral palsied families were representative of the New Jersey families in general. Odoroff similarly treated 300 cases taken from the alphabetic files of cerebral palsy cases seen at clinics in New Jersey. The percentages for both studies in relation to seven different occupational groups are as follows:

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[1] J. Thomas McIntire, The Incidence of Feeble-mindedness in the Cerebral Palsied, *Proceedings of the American Assn. on Mental Deficiency*, 1938, Vol. 43, pp. 44-50

[2] M. E. Odoroff, The Occupational Background of Cerebral Palsy, *Amer. J. of Mental Deficiency*, Vol. 49, No. 3, January 1945

		McIntire %	Odoroff %
I	Professional	2	3
II	Semi-professional	9	8
III	Clerical, skilled trades, retail business	24	21·7
IV	Farmers	—	2·3
V	Semi-skilled, occupational, minor clerical	37	35·7
VI	Slightly skilled trades and other occupations requiring little training or ability	20	11·3
VII	Day labourers of all classes	8	18·0

These can be conveniently translated into three groupings to compare the results with figures obtained for 301 of the cases in our Midland survey. This is done in Table XXII below.

TABLE XXII

Percentage Distribution of Cerebral Palsy Cases amongst Socio-Economic Groups. Comparison of English and American Figures

Socio-economic group	Odoroff	McIntire	Schonell-Asher
Superior	11	11	20
Average	60	61	58
Below average	29	28	22

It will be seen that the figures from the American and English investigations are similar and support Odoroff's contention that 'cerebral palsy is distributed among the various economic levels in direct proportion to their percentages in the population as a whole. The data presented give little evidence for presuming that any economic level is predisposed towards producing more than its share of cerebral palsied children.'[1] This is an important finding, for unlike the figures for the distribution of both mental deficiency and delinquency there is no bias towards a disproportionate number of cases in the below average socio-economic groups. For both delinquent and defective the percentage figures are of this order:

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[1] Odoroff, *op. cit.*, p. 3

	Mentally Defective	Delinquent
Group A (superior) socio-economic groups	2	2
Group B (average) ,, ,, ,,	42	45
Group C (below average) ,, ,,	56	53

This heavy concentration of cases in the below-average (Group C) socio-economic groups shows that the problem of defective and delinquent is related to adverse social conditions, a correlation which is not a characteristic of the cerebral palsy problem.

(4) PARENTAL ATTITUDE TO THE CHILD WITH REGARD TO HIS PHYSICAL HANDICAP

Evidence on the parental attitude towards the child was obtained by interview, during the Terman Merrill examination, and from teachers or social workers who knew the children. The attitude of the mother was estimated in terms of three categories: (*a*) *over-protective*: doing more than was necessary for the child and hence interfering with his development of independence; (*b*) *normal*: sympathetic but allowing the child to do certain things or to try to do things for himself within the limits of his physical handicap; (*c*) *neglectful*: unsympathetic and making little attempt to provide situations that would foster the child's independence or self-esteem. Sometimes this neglect was confined to emotional and social matters, while at other times it was connected with neglect on the physical side.

The numbers obtained during the survey were:

	No.	%
Category (*a*) Over-protective	81	29
(*b*) Normal	184	67
(*c*) Neglectful	12	4

Compared with a non-spastic population this is high in the over-protective group—a bias that is easily understood but one that has its adverse influence on the social and emotional development of some cerebral palsied children, and one that we consciously took into account in our work with the experimental group at Carlson House School for Spastics.

TABLE XXIII

277 Cases of Cerebral Palsy Distributed according to Parental Attitude towards the Child and according to Child's Attitude towards the Parent. Each Distribution is given in Terms of the Economic Status of the Home.

	Socio-economic Group A (superior)						Socio-economic Group B (average)						Socio-economic Group C (below average)					
	Over-protective		Normal		Neglectful		Over-protective		Normal		Neglectful		Over-protective		Normal		Neglectful	
		%		%		%		%		%		%		%		%		%
Parental attitude	14	25	41	75	—	—	49	30	114	69·4	1	·6	18	31	29	50	11	19
	*Dep.	†Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.
Child's attitude	14	—	—	41	—	—	46	3	13	101	—	1	16	2	2	27	2	9

* Dependent

† Independent

(5) DEGREE OF THE CHILD'S DEPENDENCE ON PARENT AS INFLUENCED LARGELY BY HIS HANDICAP

The assessment of the child's dependence on his parents was bound up with the condition observed in the last section. The two states are in a sense complementary, for the child is largely as independent as the parents allow or encourage him to be. Both the over-protective and the neglectful parent tend to undermine the child's confidence and independence through inducing anxiety of varying degrees in situations that should not occasion emotional barriers for children of similar ages. The figures obtained were:

	No.	%
Dependent	93	34
Independent	184	66

It was not easy to assess the degree of dependence/independence in the presence of varying degrees of physical disability, but by assessing the child's reactions and remarks against the background of information built up about cerebral palsied children, and by checking assessments with others who observed them in additional situations, an effective estimate was made.

It will be observed that the percentages in the dependent group are almost exactly the total of the two groups in the over-protective and neglectful, which fact is supported by evidence from a closer study of some children from each group.

The data considered under Sections (3), (4) and (5) are set out in full in Table XXIII.

This information derived from the larger group was used to plan effectively for the smaller experimental group. One of the major objectives in the education of the Carlson House pupils was to introduce methods that would encourage initiative, develop independence and re-establish self-confidence.

CHAPTER XI

SUMMARY OF RESULTS FROM PART TWO

(1) 466 cases of children in the counties of Warwickshire, Staffordshire and Worcester referred as suffering from cerebral palsy were examined physically and psychologically. Sixty-six cases were suffering from some condition other than cerebral palsy, usually mental deficiency.

(2) The incidence of cerebral palsy in Birmingham, calculated on a child population of from five to ten years, is 9·2 per 10,000, *i.e.* ·92 per 1000. The incidence in three other centres which provided an unbiased sample (89,749 children) is 8·8 per 10,000 (·88 per 1000).

There is general evidence to show that incidence of cerebral palsy among children of school age is in the region of one per thousand.

(3) Of 354 cerebral palsied children between the ages of three and fifteen + years examined psychologically, 55 per cent were boys and 45 per cent girls. The difference is not statistically significant.

(4) Experience throughout the survey suggested that it is unwise to form definite estimates of intelligence for young cerebral palsied children with severe physical handicaps, or for most of those under three years of age.

(5) The Terman Merrill Intelligence Test was the most effective test for estimating the intelligence of cerebral palsied children. Allowance had to be made for certain handicaps, namely, (*a*) marked disability of the hands, (*b*) serious speech impairment, (*c*) multiple handicaps, usually motor incoordination and/or speech disability accompanied by acute sensory impairment.

(6) For this reason three I.Q. findings were employed: (i) a Tested I.Q., (ii) a Modified I.Q. and (iii) an Estimated I.Q.

Only eighty-seven of the 354 cases examined required modification of the standard Terman Merrill Test procedure. The average difference between Estimated I.Q. and Tested I.Q. for the eighty-seven pupils was 2·7 points of I.Q.

(7) Correlation of results from the first and second applications of the Terman Merrill Scale to twenty-nine cerebral palsied children aged from five to eleven years gave the very satisfactory coefficient of ·89. A later re-test with fifty children from the Queensland Centre gave $r = {\cdot}96$.

(8) The distribution of intelligence of the 354 cases over the age of three years showed that 51 *per cent had I.Q.s over* 70 while another 23 per cent had I.Q.s between 50 and 69.

(9) The reading attainments of 354 cerebral palsied children were studied. Two-thirds were non-readers, of whom one-third had I.Q.s under 70, and 58·5 per cent were pupils under seven years of age; *thus only 7 per cent of children over seven years of age with I.Q.s over 70 could not read.* Of the 113 pupils given a standardised individual reading test 71 per cent had reading quotients of 80 or more but only 23 per cent of those with I.Q.s of 90 and over had reading quotients of 100+. That is to say, *the normally intelligent and very bright cerebral palsied child tends to be given insufficient opportunity and stimulus to develop his abilities beyond mediocre levels, unless special education is provided.*

(10) An analysis of socio-economic groups from which cerebral palsy cases come shows that *cerebral palsy is not confined to any particular socio-economic group* but is found distributed throughout all groups from those of the most favourable to those of the least favourable socio-economic conditions.

(11) There are amongst cerebral palsied children a disproportionate number of children (29 per cent) who are over-protected, even making allowance for certain physical handicaps in many cases.

(12) An estimate of this from another angle, namely of the degree of dependence/independence of the child on the parents, gives a very similar figure for pupils over-dependent on their parents, namely 34 per cent.

(13) An analysis of the relationship of intelligence to the form of cerebral palsy was based on 277 spastics, 41 athetoids,

4 ataxics and 18 cases of mixed type. There was no statistical difference between the mean I.Q.s of the groups.

(14) An analysis of the Estimated I.Q.s of 263 children grouped according to various physical categories of spastic paralysis showed no statistical difference between the mean I.Q.s of hemiplegics and paraplegics. There is, however, a distinct decline in the mean intellectual levels of the quadraplegic group of children.

(15) An examination of the relationship between I.Q. and degree (not kind) of physical disability shows a constant fall in mean I.Q. from the slightly handicapped group (mean I.Q. 81·8) to the very severely handicapped group (mean I.Q. 24·6). There is considerable overlap between the groups—the standard deviations range from 16·9 to 25·5.

PART THREE:
PRACTICAL APPLICATIONS

CHAPTER XII

EDUCATIONAL PROVISION FOR CEREBRAL PALSIED CHILDREN

DURING the survey an investigation was made of the kind of education, if any, that each cerebral palsied child was receiving. A careful study was made of educational institutions of various kinds, including ordinary schools, schools for spastic children, schools for the physically handicapped, open-air schools, special schools for the educationally subnormal, hospital classes and occupation centres.

From this information it was possible to formulate a scheme for the most suitable forms of educational provision for cerebral palsied children with varying degrees of mental and/or physical disability.

FACTORS DETERMINING EDUCATIONAL PROVISION

There are five main factors to be borne in mind when determining the form of education most suitable for a cerebral palsied child. These are:

(1) his intellectual level,
(2) his physical disability,
(3) his emotional adjustment,
(4) the location of his home with respect to schools,
(5) the nature of the home background and family relationships.

(1) *Intellectual Level*

It is the ambition of almost every parent of a cerebral palsied child to have his child attend an ordinary school like his normally equipped fellows. This desire is due not only to the belief that the child will thus have a good education but possibly even more to the feeling that attendance at an ordinary school dispels any suggestion of mental stigma or deficiency.

Even when parents are ready to accept the fact that their son *is* of subnormal intelligence it is sometimes difficult to convince them that he will be more suitably catered for in a school of a special kind where special attention is given to training through manual activities rather than to academic courses. This, however, does not apply to the special schools for cerebral palsied children. Parents of children with severe physical disabilities realise the advantages of a school which provides specific education and physical treatment and most are anxious that their children should be admitted irrespective of their mental calibre.

But it is obvious that a boy of low-grade mentality who cannot profit from ordinary educational methods if he has no physical disability is even less likely to do so with the added disadvantage of a physical handicap. Just as the modern aim of educational organisation for classes in ordinary schools is to include only those pupils whose intellectual levels will permit them to profit from the instruction and reach satisfactory attainment levels, so it is advisable to set a lower limit to the range of intelligence in classes in a special school for physically handicapped children. As is shown in Chapter XIII, which deals with the progress of children in the Carlson House Experimental School for Spastics, the intelligent child is more able than his less fortunate intellectual inferior to profit both from education and from physiotherapy.

Thus it would seem reasonable to make level of intelligence[1] one of the primary factors determining the kind of education to be allotted to a particular child.

(2) *Physical Disability*

In deciding the form of education for cerebral palsied children nature and degree of physical disability are almost as important as level of general intelligence. In the 354 children studied disability ranged from those with but slight physical handicap, through varying degrees of ability to walk and maintain balance, to children bedridden or in wheel chairs. Physical disability, as a determinant in the type of education selected, thus relates to four main groups of pupils:

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[1] Making due allowance for any margin of error in the assessment of the intelligence of the pupil and making every attempt to base the assessment on as full evidence as possible

A, children with a slight physical handicap,
B, children with a moderate degree of handicap,
C, children with handicaps so gross or diverse as to demand that their schooling be of a special kind,
D, children who because of their physical disability are unable to attend a school at all.

(3) *Emotional Adjustment*

The emotional adjustment of the child is an integral factor in his happiness and in his success, whether at work or at play. For this reason account should be taken of his personality development and of his emotional reactions. This aspect of the child's life should have a direct bearing on the choice of education for him, particularly when the question of a residential school is being considered.

Cerebral palsied children, more than normal children, are inclined to be over-protected and sheltered. Their physical dependence tends to increase their psychological dependence and both these features can often be counteracted by judicious handling on the part of teachers and therapists experienced in dealing with handicapped children.

(4) *Location of Home with respect to Schools*

Results from our survey emphasised the paramount importance of the location of the child's home with respect to schools. Nature of the child's handicap and where he lives are closely connected factors to be considered when deciding his attendance at either a day school or a residential school.

The Day School

For young children up to the age of about ten years, my experience suggests that it is preferable to give them the security of the home while attending a day school. But the question of travelling long distances to school each day is a serious consideration, even where transport is provided. Particularly with a younger or badly handicapped child, a long bus or car journey may prove very tiring and may minimise the benefit he could derive from his treatment and education. Cerebral palsied children tire more quickly than normal children and this emphasises the need to watch carefully the effect of travelling on particular cases.

Some pupils of the Mosman Centre, Sydney, travel as much as twenty-seven miles to school each day with apparently no ill effects. But in the Birmingham school attendance was limited to children from within a radius of about eighteen miles.

Where children do travel long distances or where, for some other reason they fatigue easily, it is advisable to arrange their treatment and education programme to allow for a rest period when they arrive at school.

In large cities, where there are likely to be enough intelligent cerebral palsied children to fill a school, a day school would seem the best provision, but where a child is living too far away to travel daily it may be possible to arrange for him to stay in the city for short or long periods during which he attends the day school. In such cases the mother may attend the school with her child and learn how to supervise his exercises in physiotherapy. She may also learn from observation the best way to handle him in the many trying situations that arise in the daily routine.

The Residential School

When for some reason, such as the isolation of the home, it seems preferable to send a child to a residential school it would seem advisable to choose one that is fairly accessible for parents to visit. In this way the child is reassured and relaxes more readily—an essential element in the welfare and progress of cerebral palsied children.

The Hostel

When no residential school accommodation is available and children live too far away to attend the special day school, the establishment of a hostel is useful. This solution has enabled the Mosman Centre,[1] in Sydney, to give education and treatment to a number of country children who would otherwise have been deprived of it.

(5) *The Nature of the Home Background and Family Relationships*

The wealth of evidence from our survey clearly demonstrates that the nature of the home background and family relationships has a direct bearing on the kind of education most suitable for the cerebral palsied child. Some homes are obviously unsuitable because of grossly adverse economic and/or moral conditions and in such cases the solution may be to send the neglected child to a residential school. But some homes, which appear very satisfactory on the surface, are characterised by a tension which can jeopardise the child's chances of progress, both physical and psychological. This is particularly so where the child is severely handicapped and in such cases it is essential to arrange for him to be away from home for at least some part of each week if not attending school in the regular way.

On the other hand, many of the parents of cerebral palsied children combine their efforts in an endeavour to compensate their afflicted child for what he suffers. On occasion this desire may lead parents to over-protect and spoil their child or to shut him off from the world of reality because of what he may suffer there. In such cases parents should be encouraged to let their child attend school and live as nearly like other children as possible, so that he may be helped to accept his disabilities and adjust himself to the realities of the world in which he lives.

SCHEME OF ORGANISATION

From data gathered during this research the following suggested scheme of educational provision for cerebral palsied children with varying degrees of physical and mental ability has been compiled (Table XXIV).

Broadly speaking, each of the physical categories—slightly, moderately, severely and very severely handicapped children —may be subdivided according to their level of mental ability,

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[1] For a description of this hostel see Chapter III, p. 21.

TABLE XXIV

Suggested Educational Provision for Children with Varying Degrees of Mental and Physical Ability

Physical classification	Mental levels	Suggested educational provision
A, Slightly handicapped	(*a*) Intelligence within normal range of physically fit population, including supernormal, normal and dull (I.Q. 70 and above)	Ordinary school
	(*b*) Feeble-minded (I.Q. 40-69)	Special school for educationally sub-normal or occupation centre
	(*c*) Imbecile and idiot (I.Q. below 40)	Institution
B, Moderately and C, Severely handicapped	(*a*) Supernormal, normal and dull (I.Q. 70 and above)	Special school for cerebral palsied or school for physically handicapped children
	(*b*) Feeble-minded (I.Q. 40-69)	Special occupation centre
	(*c*) Imbecile and idiot (I.Q. below 40)	Institution
D, Very severely handicapped	(*a*) Supernormal, normal and dull (I.Q. 70 and above)	Home teaching
	(*b*) Feeble-minded (I.Q. 40-69)	Home training
	(*c*) Imbecile and idiot (I.Q. below 40)	Institution
Intelligent children who cannot avail themselves of central educational facilities		Home teaching by itinerant teacher or by correspondence
Feeble-minded children who cannot avail themselves of central educational facilities		Home training by itinerant teacher

and the type of education from which a particular child is likely to profit most will depend largely on the subdivision to which he belongs.

A detailed consideration of the various categories in Table XXIV, together with their implications for an educational system, is made in the ensuing sections of this chapter.

A. *Children with Slight Physical Handicap*

A (*a*): Intelligence within the normal range of the physically fit population, including *supernormal, normal and dull children.*

The supernormal, normal and dull cerebral palsied child with a slight physical handicap is catered for in the ordinary schools. If his disability is so slight that it has not interfered with his early schooling he often makes good progress and his physical condition is hardly noticed. On the other hand, if his handicap has necessitated frequent absences from school, he may have fallen behind in his school work, and in such cases individual tuition of some kind is often necessary to enable him to attain normal standards in school. Such a case was that of Donald, aged 11·3 years, whose attendance at the ordinary school had been very irregular owing to his physical disability. Although his tested I.Q. on the Terman Merrill was 139 he failed to gain a place at the secondary school examination. Enquiries elicited the information that he had numerous gaps in his knowledge due to frequent absence from school in order to attend hospital. Only during the last year had his school attendance been at all regular. Obviously such a child needed individual diagnostic tests to discover his weaknesses, and graded remedial assignments to repair the losses. But this individual attention was difficult in a large class of children at the ordinary school.[1]

Sometimes slightly handicapped children are sent to a school for physically handicapped children when they first go to school, and later no one suggests that they should change their school when, with increased years, they are able to withstand the stress of the usual and acceptable activity of an ordinary school. Some of these pupils, particularly the brighter ones, follow a mediocre course at school and later achieve only a minimum standard of employment when they might have reached a high level of intellectual achievement if they had had the inspiration and competitive stimulus of a class of their own mental calibre. At the present time some of the schools for physically handicapped children enrol children of low grade intelligence[1] and the result is that the range of intelligence quotients in a class may be from 40 + to 130 +. Under such circumstances it is little wonder that the brighter pupils tend to remain considerably below their potential in scholastic achievements.

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[1] It has been recently reported that such children benefit greatly where remedial groups are organised in schools (as in Edinburgh) or by attendance at a remedial education centre, as for example, those established by the University of Birmingham Institute of Education, and the University of Queensland.

B and C. *Children with Moderate or Severe Physical Handicap*

B and C (*a*): Intelligence within the normal range of the physically fit population, including *supernormal, normal and dull children.*

Intelligent children with moderate or severe physical handicaps are those to whom special consideration should be given, for recent research suggests that many in this group can be helped to a richer, fuller and more profitable life if given special education, together with modern treatment for their physical disabilities. It is in relation to this aspect of the problem that we must decide what are to be the final criteria by which to judge the claims of each child for a particular kind of education. From the results of my research I would suggest that there are two main criteria: *To what extent is the child capable of being made self supporting?* and *To what extent can the child be helped to a more normal intellectual and emotional life?*

The two criteria of independence, or partial independence, and mental adjustment should be regarded as complementary for deciding a child's claim for inclusion in any special educational organisation.

The Special School for Cerebral Palsied Children

We should aim at providing specialised schooling, either day or residential, for all handicapped cerebral palsied children whose intelligence falls within the normal range of the ordinary school population (I.Q. 70 and above). But until such facilities are available it is advisable to give preference for inclusion to children of higher intelligence, as these are more likely to respond both to physical treatment and to educational guidance than the less intelligent. For similar reasons younger rather than older children should be admitted.

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[1] See Table XXVII.

The Special School for Spastics might cater in different ways for three groups of children:

(i) The intelligent, less handicapped child, who has fallen behind in school attainments on account of sensory defects or absence due to hospital treatment, may be admitted for a period of special tuition to bring his attainments up to normal before sending him to the ordinary school where large classes preclude the individual attention necessary for such a purpose. One such child during a year in the Carlson House School for Spastics made an improvement of almost four years in her reading attainment. She was then ready to be admitted to an ordinary school.

(ii) The child with moderate physical handicap may be admitted with the aim of reducing his physical handicap and improving his educational attainments to a point where he will be able to attend an ordinary school.[1]

(iii) The child with severe physical handicap may need to be catered for in this special type of school for all his school life.

In the interim, inevitable before sufficient schools can be organised to accommodate all the suitable cases, the special schools for physically handicapped children are serving a most useful purpose in taking these children. But many districts are without such provision. Where they do exist their value would be enhanced if the cerebral palsied children could be grouped under teachers trained in a school for spastics. Moreover, if these schools are to be really effective, care should be taken to ensure that they have adequate facilities for physiotherapy and speech therapy, so that all children can have regular treatment according to their needs.

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[1] Such children may continue as out-patients at the physiotherapy centre of the school, and 'follow-up' work should be done on the educational side.

A, B and C (*b*). *Feeble-minded Children* (*High Grade*)

A (*b*). The feeble-minded child whose physical handicap is slight is perhaps best placed in the special school for the educationally subnormal[1] or the occupation centre. Here he can be trained in certain selected mechanical tasks according to the level of his mental ability and within the limits of his physical handicap. He can learn to become a social being and can obtain some help and training from contact with others in a group. Some in this group may benefit from lessons in reading and simple number.

B and C (*b*). The feeble-minded child whose physical handicap is moderate or severe still remains a problem. Some of these children are capable of learning to read, and to understand very simple money operations; they may also have good use of their hands and be able to learn some handwork. Where such cerebral palsied children are not provided for, a solution may be to organise *Occupation Centres* where they can be given training suited to their various capacities. It might prove economical and advantageous to combine such a centre with the Play Centre[2] so that facilities could be made available to all members according to their requirements.

In dealing with these less intelligent children it is easy to drift into the assumption that they can best benefit from inclusion in a special school for the intelligent cerebral palsied.

Today psychologists and educationists agree universally that each child should have education suited to his abilities and should not be left to drag along at the bottom of the class on the pretence that he is learning what is obviously beyond his ability to assimilate. Where pupils of all intellectual levels have been grouped together these less intelligent children leave school with seven or eight wasted years behind them and with no real preparation for facing the future. No one is deceived by the statement that the boy or girl had normal schooling—least of all the child or his parents. How much more sensible it is to educate these children in separate classes or schools where a minimum of time is spent on abstract subjects like reading and arithmetic and where most attention is paid to training in self-help and in such things as domestic work, gardening, handicrafts, and, where possible, simple technical tasks like sewing, easy carpentry, etc. Here, too, pupils learn to co-operate with others and so as adults become more acceptable in the social scheme. Moreover, instead of the frustration of constant failure in school work they find joy in the pleasures and tasks within their limited powers of comprehension. The parents too feel that a sincere effort is being made to help their children and they appreciate the partial freedom that they enjoy while the children are away from home.

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[1] Unfortunately, provision for children of subnormal intelligence has previously been inadequate in many parts of Britain, but the Education Act 1944, making obligatory for all children the provision of 'education suited to the age, ability and aptitude' of the children should remedy this. Already some progress has been made in this direction.

[2] See page 110.

A, B and C (*c*). *Imbeciles and Idiots* (*I.Q. below* 40)

Children whose mental level is very low are best catered for in a residential institution. Observations made during this research indicate that where such children remain in the home they not infrequently act as a disruptive force to the rest of the household. During the research it was found that in almost every case such children were treated with care and love, and most parents were reluctant to allow their child to go to an institution unless they could be assured that he would receive reasonable attention there. But anyone who has worked with these children will readily agree that the daily care of such a child, month after month and year after year, must create an unnatural tension which sooner or later is likely to cause serious disharmony and psychological problems for the other members of the family. It is particularly important that institutional provision should be made for such children when there are normal siblings in the home.

D. *Children with Very Severe Physical Handicap*

The majority of cases in this group are so physically and mentally disabled that little can be done for them beyond the essentials of feeding and bodily care. Usually there is little response to outside stimuli, so that the problem of intellectual or emotional experience is reduced to a minimum. When there is an indication that a child in this group may be of higher intelligence he should be included in Group C, the severely handicapped, for educational consideration. If, as is likely, his physical handicap is so great that attendance at a school or centre is impossible, then it may be possible to help him by the provision of home teaching or home training.

Most of these children, however, being very severely handicapped both mentally and physically, are best provided for by institutional care, and indeed the great majority of the cases in this category seen during our survey were in institutions.

Suggested Educational Provision as applied to the Sample of Cerebral Palsied Children used in this Research

In Tables XXV and XXVI an attempt has been made to indicate the numbers of children in the research sample who fall into each of the educational categories discussed in this section. It will, however, be evident that further analysis of data would be necessary before a final organisation for all the children could be set up. For example, the location of the child's home in respect to available schools is of the utmost importance. Children derive much greater benefit both educationally and socially from being in a group with other children, but where there are insurmountable barriers to this, then the next best thing is education in the home.

Home Education

For those children who for one reason or another cannot attend school, it is suggested that some kind of home education by itinerant teachers or by correspondence[1] should be organised. The form that this education or training might take would be conditioned by the mental and physical ability of the child. The intelligent child should be encouraged and given opportunities and materials to enrich his mental life as much as possible; the less intelligent child could be helped to become less dependent

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[1] Much effective education is carried out by correspondence classes in Australia, where children are on farms or stations in isolated districts. Handicapped children are assigned special teachers who initiate a variety of ingenious methods and apparatus for helping their pupils.

TABLE XXV

Numbers of Children in Junior (Three to Ten Years) Age Groups Suitable for Each Form of Proposed Educational Provision. N = 249*
(This Classification is based on Physical and Mental Assessment of Each Child.)

Proposed educ. provision	Degree of handicap				
	Slight	Moderate	Severe	V. Severe	Totals
Ordinary school	22	2			24
Spastic or phys. hand.	22	71	31	2	126
Home educ.		See Notes			
E.S.N.† or occupation centre	11	21	12		44
Institution	1	15	26	11	53
Other schools			2		2
Totals	56	109	71	13	249

* Eleven cases are omitted from this table. Of these, three have died since the survey was made, and eight cases are omitted where it was not possible to obtain an estimate of their intelligence.

† E.S.N. = Educationally subnormal

TABLE XXVI

Numbers of Children in Senior (Eleven to Fifteen Years) Age Groups Suitable for Each Form of Proposed Educational Provision. N = 94
(This Classification is based on Physical and Mental Assessment of Each Child.)

Proposed educ. provision	Degree of handicap				
	Slight	Moderate	Severe	V. Severe	Totals
Ordinary school	18	5			23
Spastic or phys. hand.	9	19	5		33
Home educ.		See Notes			
Occupation centre	2	11	5		18
Institution	2	4	6	8	20
Totals	31	39	16	8	94

physically and also to learn to do some simple handwork.

In this connection, raw materials might be purchased by a member of the central organisation, who, if the spastic worker so wished, might sell the finished articles. The more intelligent adolescent or adult worker can often produce quite excellent articles and so contribute towards his keep, at the same time maintaining his self-esteem. The less intelligent may manage to earn a little, but even if he does not, he is kept occupied and so is less of a burden to his family.

The Play Centre

For those children who are thus confined to home it is most desirable that opportunities be made for them to meet in groups whenever possible, and for this purpose the establishment of play centres where children can be brought for the day or half-day on one or more days a week is suggested. Such a play centre would provide suitable play apparatus of an educative type in addition to the usual toys for recreational purposes.

The children's mothers could form a roster for helping the children generally, but it would be advisable to have one trained person, possibly with teaching experience, responsible for their basic training. Her duties would include the supervision of apparatus, storytelling, nature talks, music and rhythm, recitation, handwork and games.

Present and Suggested Educational Provision for 289 Cerebral Palsied Children Aged Five to Fifteen Years

Table XXVII shows the numbers of children in this survey over five years of age either attending different types of educational institution, or at home or elsewhere. It also indicates the type of educational provision that the research worker considered suitable for these children, after taking into consideration their mental and physical conditions.

It will be noted that of the eighty-one children for whom special education at a school for cerebral palsied children was considered advisable, only three were at that time receiving such education. Since then twenty of these children have been catered for in Carlson House School for Spastics in Birmingham.

Of the seventy-three cerebral palsied children in the schools for physically handicapped children twenty-four were considered to be below the standard of intelligence required in an ordinary school, some of them considerably below. This wide range of intelligence in the schools for physically handicapped children is one reason why intelligent cerebral palsied children, particularly those with I.Q.s of 80 and above should be admitted to a special school where they will be given better educational opportunities.

Table XXVII

*Distribution of 289 Cerebral Palsied Children Aged Five to Fifteen Years found in Various Types of Establishment, together with Suggested Educational Provision**

Present provision		Suggested educational provision					
	Present totals	C.P.	Phys. hand.	Ord. school	Deaf or blind	E.S.N. or occupation	Institution
School for cerebral palsied	3	3					
Physically handicapped	73	28	19	2		22	2
Ordinary	91	31	12	40		8	
Home (no education)	81	14	11		2	18	36
Home (some education)	9	2	2			4	1
Hospital	6	3	2				1
Educ. subnormal	1					1	
Occupation centre	2						2
Institution for M.D.	23		1				22
Suggested totals	289	81	47	42	2	53	64

Of the ninety-one children attending ordinary schools forty-three had sufficient physical handicap to warrant attendance at a special school (for cerebral palsied or physically handicapped) and eight were educationally subnormal from the mental point of view.

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* Where a child is unable for some reason to attend school a home-centred programme is advisable. See discussion on educational provision.

Twenty-nine children who did not attend school warranted education in a school for cerebral palsied or physically handicapped children, and one child would have benefited from attendance at a blind and one at a deaf school.

In addition to the cases tabulated above, there were thirty-six children aged three or four years who were of normal intelligence, five suitable for ordinary school life and nineteen and twelve suitable respectively for a school for cerebral palsied and a school for physically handicapped children. Ten of these have since been admitted to the Birmingham school for spastics.

While the establishment of Carlson House School for Spastics has to some extent met the demand for accommodation in the Birmingham area, it is clear from a study of the figures given in this section of the research that much still remains to be done for the cerebral palsied children in the area covered by the survey.[1] The need is particularly urgent in the other cities where day schools might with advantage be set up, while isolated cases from more rural districts might be accommodated in residential schools.

Some of these last-mentioned might be brought into the Birmingham scheme with the opening of a house, divided into several flats where a mother from a distant town or village could bring her child for certain periods during which he attended Carlson House as a day boarder.

CONCLUSIONS

A study of the material given in this section of the research explains why superficial figures about the numbers of cerebral palsied children already attending schools—either ordinary elementary schools or schools for the physically handicapped —are likely to give a wrong impression concerning the needs of the community. It does not necessarily follow that because a child attends a certain school he is therefore deriving the utmost benefit from education there. It is common knowledge that where children of high or average intelligence are taught in the same class as children of low grade intelligence none of the pupils gets really effective teaching. Moreover, we should not assume that because handicapped children can attend a normal school they are therefore able to make progress commensurate with their intellectual potential. These facts have been amply illustrated by the progress made by children admitted to the Carlson House School for Spastics and to the Australian Spastic Centres.

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[1] Since this was written three cerebral palsy units have been set up in the area covered by the survey, at Stoke-on-Trent and Coventry and in Warwickshire.

Hence, although it is our aim to encourage cerebral palsied children to go to ordinary schools whenever advisable, the criteria for attendance should be wider than just ability to stand or walk. We should ask, *Is this type of education the one most suited to this particular child?*

It has been suggested that all cerebral palsied children whose physical disabilities prevent them from attending schools for the physically handicapped should attend a centre for physical treatment and social training up to the age of nine years, when the intelligent members of the group would be selected for formal education. This thesis is based on the assumption that children make better educational progress when their energy is not being diverted by physical treatment. That this is so can only be proved by the conduct, on strictly scientific lines, of a controlled experiment. In my own research the indications have been that handicapped cerebral palsied children make more progress when placed in a school where they receive intensive treatment than when they attend normal schools or schools for the physically handicapped. Reference is made in a later chapter[1] to a controlled experiment, carried out at Carlson House, which bears out this contention.

A further disadvantage in postponing formal education till the age of approximately nine years is obvious from a study of educational principles. The optimum age for learning the rudiments of reading and number, for instance, appears to be between six and nine years. During this period most children are keen to acquire these skills and enjoy the repetition so useful in learning. To deny intelligent handicapped children the opportunities of success in achievement would surely be an error. People who advocate withholding educational provision until a certain proficiency is attained on the physical side disregard the proved interconnection of the physical and psychological in our make-up. Psychological frustration is just as devastating as physical frustration, and if education, handled efficiently with the modern outlook, can supply some measure of successful accomplishment, then, far from absorbing energy needed for physical therapy, it can prove a valuable asset in producing a more contented outlook for the furtherance of the physical aspects of treatment. It is usually found that the cerebral palsied children who make least progress are the ones whose education has been neglected until the age of ten or twelve years, while the little ones show remarkable interest and patience in tackling assignments, and progress at a truly surprising rate. Surely no good could come from placing these children in schools with feeble-minded children.

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[1] See Chapter XVI, p. 146.

Finally there is the question of the lower I.Q. limit for children admitted to schools for cerebral palsied children. It is true that the highly intelligent handicapped child usually benefits more from education than the dull child, but this is so for all children. Yet we do not, for that reason, deny the dull child (I.Q. 70-85) the best teaching available. Enlightened education authorities educate dull children in special classes where standards of achievement are relaxed and suitable methods are used to help those of restricted intellect. Because a cerebral palsied child cannot walk and his I.Q. happens to be below 85 or 80, should he therefore be refused the opportunity to learn reading, simple number, social studies, etc.? Yet these are the limits set by some schools for cerebral palsied children. What is to become of these pupils? Are they to be denied education altogether or must they be satisfied with attending an occupation centre with the mentally defective? If we insist on this procedure let us admit that we are being actuated not by the good of the child but by the cost of the system.

CHAPTER XIII

CARLSON HOUSE EXPERIMENTAL SCHOOL FOR SPASTICS

THE original funds for establishing and equipping the Carlson House Experimental School for Spastics came from voluntary sources, mainly those of Paul Cadbury, but the Trustees were assured by the Minister of Education that once the school was in being the Ministry of Education would bear half the original cost and would thereafter give a maintenance grant to cover running expenses, insofar as these were not met by the local education authorities sending children to the school. The local education authorities in turn undertook to pay fees for each child admitted from their respective counties and also to provide transport for the children to school.

Hence from the outset a close liaison was developed between the School Council, the Ministry of Education, the local education authorities and the University Department of Paediatrics and Child Health.

SELECTION OF STAFF: TEAM WORK

After careful observation of existing centres, it would appear that the basic requirement in setting up a school or centre is the wise choice of staff. In order to preserve the healthy, happy atmosphere of the school, it is essential that the whole staff, both professional and domestic, should work *as a team*. However, in a school where various staff members are concerned with different aspects of the child's welfare, it is natural that the conscientious staff member may be biased as to the relative importance of education and therapy. And even when the balance of time for treatment and other similar matters have been settled, there are frequent occasions when friction is avoided only if the staff members are both tactful and co-operative. In such a set-up a great deal depends on the character and temperament of the head teacher or director, and hence the choice of this member of the staff is of the utmost importance.

When selecting staff for Carlson House it was realised that, having chosen a head teacher, Miss Christine Woodall (now Mrs Brown), in whom they had confidence, the Council should ask her to join the board for the selection of staff members. She was also intimately concerned with every aspect of the establishment of the school and with the provision of equipment. She took a lively interest in the children as they came up for clinical interview and visited many of them in their homes. She also visited existing centres for spastic children and so built up as good a background as possible against which to begin her practical work with the children at Carlson House.

Throughout the survey, the head teacher was in constant touch with the research workers, so that the two projects proceeded side by side. This relationship was particularly helpful to both the head teacher and the psychologist, especially after the school had opened and many problems, both psychological and educational, presented themselves.

THE PURPOSE OF THE EXPERIMENTAL SCHOOL

In 1947 Carlson wrote: 'During recent years considerable progress has been made in therapy. Clinics devoted to giving physical and occupational therapy and speech training are more numerous now than they were a year ago. Advances have also been made in the use of braces, drugs, and surgery. But it is appalling to learn that the attention given to education is nil in comparison.'[1]

This was a harsh criticism, but, from the observations made during this research and in visits to other countries, it would seem to be justified. In some of the schools and centres for cerebral palsied children the chief aim appeared to be to keep the children occupied between treatment sessions, and so long as the children had pieces of apparatus before them the supervisor was satisfied; such places are cerebral palsy centres or clinics, not schools in the fuller sense of the word.

[1] Earl R. Carlson, Give them Education, *The Crippled Child*, December 1947

Hence it seemed psychologically sound to establish a school as much like an ordinary school as was possible for these handicapped children. The fact that they attend a school rather than a centre or clinic gives them more confidence in themselves and brings them closer to the great mass of normal children who also 'go to school'.

Moreover, these children were coming to school not merely to be kept occupied while awaiting treatment, but really *to be educated.* In establishing the experimental school it was planned to enable the pupils to learn as much of the basic subjects as possible so that they would have sufficient competence in such skills as reading and writing to be able to help themselves at other times. In addition, it was hoped to make the rest of the curriculum interesting and informative to aid in the development of their personality and in the preparation for their leisure occupation.

It was realised that each child's attainment would vary with his mental level and physical handicap, but the small classes would enable a considerable amount of individual attention to be given and hence the children would progress at their own rate.

But apart from the merely educational aim of the instruction, there is every reason to believe that occupation in school work, success obtained in learning to read and to write, and interest aroused through various school activities may have a general therapeutic effect in relation to each pupil's mental attitude towards his physical limitations. In fact the whole of occupational therapy has fully demonstrated this fact. This value of a wide and effective educational programme is borne out strongly in Carlson's ideas when he says: 'The traditional view was that a crippled child could not develop mentally beyond the limits of his motor experiences, since he had to translate ideas into muscular activity in order to grasp them, and that therefore the first object in treating a spastic was to educate his muscles until some control had been obtained. The question of academic training was put off until this goal was attained, or neglected entirely. But I believe that the mental growth brought about through academic training promoted an improvement of physical control, or at least developed the ability to circumvent the physical difficulty.'[1]

SELECTION OF THE FIRST TWENTY PUPILS

From an experimental point of view it was considered advisable to include in our first admissions to Carlson House children of varying mental levels.[2]

Thus when the final list was completed it contained children with estimated basic I.Q.s as follows:

Number of Children	*Estimated Basic I.Q.*
5	70-84
13	85-104
2	105 +

In dividing the twenty children into two school classes mental age was taken into consideration rather than chronological age for those few cases occasioning extra care in placing. This proved to be a most satisfactory solution.

In the first instance, it was decided that, as we had only two teachers to start with, the age range of the children would need to be restricted, and so we set the lower limit at five years and the upper limit at eleven years. As the eldest two pupils had estimated I.Q.s of 78 and 85 respectively, their mental level was but little above that of several other members of the class and actually below that of the brightest boy.

The next factor that had to be observed was the location of the child's home. Carlson House being a day school, it was thought unwise to enrol children whose homes were more than about eighteen miles from the school as the long daily journey might be too tiring for handicapped children, particularly during the winter months. The children were transported by taxi, those from neighbouring districts travelling together.

Finally, it was obvious that children with severe physical handicaps should be given priority over the less handicapped, but on the other hand it seemed unwise to select all children who were severely handicapped in any one respect. For example, if all were unable to walk the work of the staff would be so heavy as to necessitate increased staff members, or if, on the other hand, all the class members had gross speech difficulties, lessons would be greatly curtailed. Moreover, in such circumstances there might develop an attitude on the part of the children of acceptance of their disability without any attempt to overcome it; in fact, the atmosphere of non-walking and/or non-talking would certainly have had an inhibitive influence on the development of the group.

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[1] Earl R. Carlson, *Born that Way*, p. 135

[2] A complete table of estimated I.Q.s of these children is given in Chapter VI (Table VI).

The attitude of the research workers was that by selecting a group of children with varied degrees and types of handicap the staff's burden was to some extent lightened and made more interesting, while the children benefited in several ways. First, the more mobile pupils could help to fetch and carry for their less mobile companions, those who could use their hands could aid others whose fingers fumbled, while those whose speech was very defective could often find a playmate to help them over a difficult situation. Secondly, this mutual help would be beneficial not only to the staff and to the handicapped child but also to the helper, whose self-confidence would improve as he realised that he was able to be of some use after all. In actual fact, we found as the months went by that this factor in selection was one of the most important, with its far-reaching effects on social development and emotional attitudes as well as on academic progress.

Our original idea was that children who could not walk would be encouraged to co-operate with the physiotherapist by the success of others whom they saw making improvement in this direction. And this was often the case. But sometimes the child's reaction was not what we anticipated. For example, Ernest and Elsie had been friends before they became pupils of Carlson House. They were both seven-year-old spastic paraplegics of average intelligence and without speech or hand defect. Both had severe disability of the legs but could hobble along with assistance. On admittance to Carlson House they were taken off their feet altogether so that they would learn correct muscle movements under the supervision of the physiotherapist. It was natural that these children should at first be depressed by their seeming physical retrogression but the situation was explained to them and they learned, to some extent, to accept the position. Being intelligent children, their co-operation was good and after nine months Elsie was allowed to walk with the use of sticks. Her gait was now greatly improved and she was delighted with the success of the treatment. Ernest, on the other hand, was not so fortunate; for certain medical reasons his condition did not respond to treatment as readily as Elsie's did and he was still confined to his chair. In this case the fact that Elsie was now fast becoming one of the mobile children, while being a spur to some of the younger non-mobile children, made Ernest impatient and depressed.

PRE-SCHOOL OR KINDERGARTEN CLASS

The more experience one has with cerebral palsied children the more convinced one becomes of the desirability of having a pre-school or kindergarten group attached to a school for cerebral palsied children. Education authorities tend to disclaim responsibility for this age group, yet the importance of physiotherapy and social training for these children cannot be over-emphasised. The medical specialists maintain that only by beginning treatment at a very early age can we hope to get maximum success in preventing the deformities that characterise most cerebral palsied adults. An integral part of this treatment is the maintenance of good posture and correct muscle movements, which can be effectively supervised only by someone trained for the task.

From a psychological point of view too, the cerebral palsied child in a pre-school group is partially compensated for his lack of mobility by the social contacts of his contemporaries, while the friendly, reassuring atmosphere of the good nursery class goes far towards banishing the sense of insecurity which physically handicapped children exhibit.

At the Mosman Centre, Sydney, the beneficial results of this early training are already evident in the reduced handicaps of children who have had several years of treatment from an early age as compared with the older group whose handicaps were already well established before treatment was begun.

Hence, those planning education and treatment for cerebral palsied children will realise the importance of provision for this group. Where education departments are not prepared to undertake this, it is recommended that the school council provide the funds from voluntary contributions until the education authority revises its decision, as was the case in our Queensland Centre, where all teachers are now paid by the Education Department.

CHAPTER XIV

THE FIRST TERM IN A CEREBRAL PALSY SCHOOL

PERHAPS the most important element in the satisfactory establishment of a school for cerebral palsied pupils is the elimination of a feeling of insecurity which is strongly marked in these children. A number of the pupils at Carlson House had not been to school before, and the social contacts of all had been much more restricted than those of normal children. Consequently their first attendance at school was a more trying experience than it was for their physically fit contemporaries.

Again, the kind of contacts they had made was, for some of them, not reassuring. These had been largely in hospitals, with which they were likely to associate unpleasant, if not actually painful, experiences.

Moreover, the nature of their handicap tends to produce an exaggerated feeling of insecurity and loss of self-confidence. Their attempts to make movements are continually frustrated and this in itself causes an emotional tension and an attitude of mental dependence which form an unfavourable foundation on which to build a feeling of security and contentment.

Yet unless it provides these qualities of security and contentment for its pupils, the school for cerebral palsied children will fail in its main purpose, for it is only in such an atmosphere that children can relax and so make progress, either physical or mental.

CO-OPERATION OF PARENTS[1]

From the outset the school staff sought the co-operation of the parents, on whom they depended for supervision of the children during out-of-school hours. As the aims of the school were physical, psychological and social as well as purely educational in nature, it was essential that parents carried over, as far as possible, the same treatment and attitudes towards the children as the latter experienced in school. Hence in the early stages of the experiment it was often necessary to discuss with a parent reasons for certain steps in the physical or the psychological aspects of her child's treatment. For example, Elsie was a spastic paraplegia who walked with extremely bad gait. The physiotherapist explained to the parent and the child that this was because certain muscles used in walking were functioning wrongly, and it was necessary to keep Elsie off her feet while teaching her to make correct muscle movements under supervision. Only when the parent was convinced of the necessity to observe such treatment rules strictly could she be depended upon to follow them at home.

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[1] This was facilitated to some extent by (1) contacts made by the head teacher and the research workers during the survey, (2) the attendance of the mothers as helpers in the school one day a week, (3) the strong Parents' Association, at the meetings of which staff and parents often met.

Similarly, efforts on the part of the school staff to encourage one boy's independence and to help him to become more stable and self-controlled were fruitless while the parents alternately spoiled and thwarted him at home. This boy (chronological age 6·11, mental age approximately 5·6), who had severe physical handicaps and was almost blind, was timid and apprehensive. He was very excitable and became over-enthusiastic about any anticipated event, only to become desperately miserable when anything interfered with the fulfilment of his anticipations. For days he talked of a puppy his father had promised him and then he was disappointed about this and became very despondent. Another time he looked forward to a wedding, describing the details of what was going to happen, only to be told he wasn't going after all.

A full case study of the boy showed that the parents' attitude towards him oscillated between one of excessive spoiling, allowing him to become quite tyrannical in his demands, and one of tantalising frustration. As a consequence he had failed to develop an adequate sense of security or self-confidence. This, together with a short memory span and difficulty in concentration, gave a poor prognosis for educational or physical improvement. Attempts were made to lead the parents to a realisation of the need for consistent discipline in their control of the boy, while in school every effort was made to provide those experiences which he had lacked and which would create a feeling of happiness and security. Although very defective sight and severe physical disabilities caused his progress in school work and treatment to be slow, he made definite adjustments from the psychological angle, as was evidenced in the reports of members of the staff. He became less nervous and apprehensive, he was happier in school and began to show interest in class activities, despite the fact that his handicaps prevented him from taking part in some of the lessons.

SCHOOL ROUTINE

A thoughtfully planned routine is important for a school for cerebral palsied children in that several aspects of the child's life have to be considered. Thus the need for continuity of physiotherapy without long intervals between treatment sessions makes it advisable to organise the school so that vacations are shorter and more frequent than those of the ordinary schools. As with all schools for physically handicapped children the daily hours of attendance are also different from those of the normal school, being from 9.30 a.m. to 3.30 p.m. with a short luncheon interval.

Rest Periods

Experience during the research showed that rest periods should be arranged to suit the individual needs of the children. Small children, and some of the older ones with severe physical handicaps, need a rest after lunch, but in addition to this the need arose for specific pupils to rest when they first came to school. For rest purposes it was found satisfactory to have a mattress[1] laid flat on the floor away from draughts, with a blanket to cover the child. After the rest period the mattresses were stacked in a wire rack, where they were kept in the air and yet were out of the way. Those pupils for whom a rest was not considered necessary were allowed to follow some leisure pursuit of a quiet nature during this period.

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[1] In warmer climates a more suitable provision is the canvas stretcher which allows the air to circulate freely.

Allocation of Time for Education and Treatment

Observations made during the early part of the research indicated that there could be no hard and fast rule about the allocation of time for education and treatment; this depended upon the individual needs of the children and the staff available. During the first year at Carlson House, when there were only two school classes and each class contained a large proportion of children requiring physiotherapy, occupational therapy and speech therapy, we found it satisfactory to let one class have treatment in the morning and the other in the afternoon. This meant that for either the morning or the afternoon session the teacher had her whole class for educational purposes and so could have uninterrupted periods for teaching the basic subjects and for certain class lessons. During the other half-day session, periods for free activity, handwork, drawing and certain English lessons were provided, while children requiring special help in any subject could receive individual attention. (Some of the younger pupils, who were just beginning reading, asked to be allowed to read for part of the time and thereafter this practice became quite popular.) In this way children were taken out to treatment and brought in again without upsetting the work of the other pupils. When the child returned from treatment he again took up his work.

Treatment schedules were adhered to strictly and the attendants who took the children to their respective rooms came and went with as little noise as possible.[1]

By such means the routine of the school was allowed to proceed smoothly, with a minimum of disorganisation and a maximum use of time for educational purposes. Cerebral palsied children are particularly likely to find concentration difficult, and during the first few weeks anyone coming into the room caused quite an amount of excitement, while one or two of the less disciplined pupils would call out some spontaneous remark or question. As the weeks went by, however, the children became accustomed to the attendants moving about among them and hardly noticed them, while even the youngest pupils rarely shouted a greeting to the visitor.

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[1] When a child wished to go out unexpectedly the teacher pressed a button in the room and a light indicator in the hall drew the attention of the helpers to the requirement.

Weekly Discussion of Pupils

A meeting of all members of the staff was held once a week after school throughout the year, while at the end of each term an afternoon was spent in a full discussion of relevant problems.

At each weekly meeting six children were discussed in detail, and any member of staff who wished to raise queries about any other child or any other problem did so.

Occasionally the period was spent on some special aspect of interest to the whole staff. During the first term each member of staff gave a short talk on her particular work in its application to the cerebral palsied child, for it was considered desirable that *every staff member should have some understanding of the aims and methods used by her colleagues.* The effect of these talks was to promote a better understanding of one another's problems, besides giving greater significance to technical remarks made during subsequent meetings.

Within the Classroom

Observations recorded during the research clearly showed that the successful teacher of cerebral palsied children must have a knowledge of the psychology of the handicapped child and a real, sympathetic understanding of his particular problems.

Modern education and psychology recognise the importance of studying the child *as an individual*, and this is particularly necessary in the case of the cerebral palsied. As with normal children, *development must come from within the child himself* and the success he has in overcoming his mental and physical handicaps depends partly on the amount of determination he can bring to the task. No amount of teaching or treatment will help a child materially unless he puts forth voluntary effort in the same direction at the required time.

This part of the research, based on case studies of the pupils and records of experimental approaches, clearly revealed that a full understanding of cerebral palsied children depended upon a tolerably objective estimate of their abilities and their present achievements. Only by an effective use of this information was it possible to know what could be expected of them and how to plan educational measures that would achieve optimum mental development without involving undue strain. As Lord points out: 'If training and education are to be adapted to the individual child they must be directed towards attainable goals. Over-optimistic efforts may leave the child emotionally unprepared to meet the restrictions imposed by his physical or mental disability.'[1]

To this end the members of the staff at Carlson House were given all the information available about the children with whom they were concerned; such information included approximate level of intelligence, physical limitations, sensory and speech defects, emotional traits as far as they were known, and details of home background. Armed with this knowledge, the aim of teachers and therapists alike was to encourage the child to develop his potential abilities while learning to accept his physical and mental limitations.

During the first few weeks no attempt was made to teach formal subjects. In the senior class, where pupils' ages ranged from seven to eleven years, there was a short preliminary period of settling down to a new routine with new companions in an entirely different environment. Through discussion of various interests, birds, flowers, stamps and so on, teacher and pupils quickly became partners in the quest for knowledge, and this comradeship persisted throughout the ensuing months when more formal subjects took their place in the daily programme.

In the junior class, where the children were five to seven years old, the period of adjustment was more protracted. Most of the children had not been to school before and all were severely handicapped, so that their experiential background was poor and their emotional tension was pronounced. The first tasks were to create an atmosphere of security and well-being, to get to know the children and to help them to know and understand each other, to inspire them with confidence and a pleasurable sense of freedom. This planned therapeutic[1] approach was achieved through free activity, music, stories, drawing, dramatisation and games. It was not until towards the end of the term that the first attempts at teaching, reading and number were made.

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[1] Elizabeth E. Lord, *Children Handicapped by Cerebral Palsy*, Oxford Univ. Press, 1937, Introduction

During the first few weeks, however, much had been done in the way of preparation for reading and number by the provision of various kinds of experiences that the children had previously lacked. Such experiences were introduced into their play or their stories and so their widened outlook and improved vocabulary facilitated the more definite reading preparation when they began to ask for reading lessons from real books.

[1] A similar approach is being increasingly used with backward children. See *The Young School Failure* by M. Highfield, Oliver and Boyd; and Birmingham University Institute of Education Remedial Education Centre by F. J. Schonell and W. D. Wall, *Educational Review*, Vol. 2, No. 1, 1949.

CHAPTER XV

AN EXPERIMENTAL CURRICULUM[1] FOR CEREBRAL PALSIED PUPILS

As Carlson House was the first day school of its kind to be established in Great Britain, the organisation of classes and curriculum was something of a unique venture. Consequently, instead of the curriculum being planned for the year in advance, it was rather allowed to develop as the requirements and interests of the children unfolded themselves. The whole of the curriculum was regarded in the light of an experimental try-out from which to build future schemes of work, and the results proved sufficiently successful to allow the original year's curricilum, with slight modifications, to form the framework for the next year's syllabus.

In planning a curriculum for cerebral palsied children there were other limitations to consider in addition to the usual ones of age and level of intelligence. Such limitations included those set by the physical, sensory and speech handicaps of the children.

PHYSICAL, SENSORY AND SPEECH FACTORS AS THEY AFFECT THE CLASS CURRICULUM

As each child's handicap was of an individual nature, it was obvious that the class curriculum had to be elastic enough to allow for variations from child to child. Lessons involving physical movement, *e.g.* written work of any kind or handwork, were dependent on the physical ability to use the hands; moreover, even when a child *could* use his hands he sometimes had to be prevented from doing so for a period because of physiotherapy treatment. Similarly, when Jill was prescribed a period of almost complete relaxation she was precluded from active participation in all lessons.

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[1] For much of the material concerning class curricula I am indebted to the Headmistress of Carlson House, Mrs Brown, and to the two class teachers, Miss Davies and Miss Ash. Throughout the research they were ready to discuss projects and to co-operate in every way to ensure the success of the experiment.

Postural handicaps complicated choice of subject matter and methods of learning. For example, Jill, Jack and Ron were unable to sit up or to hold their heads erect. Ron had difficulty in raising his eyes above a certain level. In all these and similar instances a modified programme of work and method was introduced.

Again, sensory and speech defects limit a child's ability to participate in certain class lessons and once more individual adaptation had to be made to suit each case.

Sometimes at the weekly staff meeting one of the therapists would ask the teacher's co-operation in a certain matter concerning a special pupil. For example, Betty was having exercises with the physiotherapist to establish correct wrist movement; she then went on to the occupational therapist, who gave her occupations necessitating these movements so that she should practise them under supervision (see Plate 4, facing page 133). At the staff meeting the teacher was asked to see that when Betty did her weaving she sat in a particular manner conducive to correct movement of the wrist and hand.

Or, again, Brian, Rita and Ron were doing finger painting and table polishing with the occupational therapist in order to develop good arm movements, and once more the teacher was asked to co-operate by letting these pupils draw pictures which involved wide arm movements, with blackboards and chalk, rather than small pictures using thin pencils.

The speech therapist and class teacher also worked in close partnership. The former had a special interest in her pupil's auditory acuity as well as his speech, and she kept the teacher informed of the child's progress. She was particularly interested in anyone exhibiting even a mild degree of high frequency deafness which might be affecting not only his speech but also his reading achievements. When the speech therapist was drilling Ron on a particular sound *e.g.* 'th' to replace 'f', as in 'think' or 'three' (incorrectly called 'fink' and 'free'), it was useful for the teacher to be aware of this so that she could help him to remember to use the correct speech in school. As the therapist was concentrating on one or two special sounds for Ron the teacher confined her help in the matter of speech mainly to these sounds and ignored any other errors for the time being.

Attention Span and Fatigue

Studies of pupils made during the research showed that cerebral palsied children have difficulty in concentrating; not only is the attention span short but they are more easily distracted than normal children, and for this reason extraneous sensory stimuli were kept to a minimum. It was found that these children tend to fatigue more easily than others and hence their performance is characterised by a variability that is seldom found in the normal school child. Hence lesson periods were made short and the types of lessons following one another were varied.

Irregular Development

Records kept during the entire research revealed that irregularity of development was a characteristic of all but the very slightly handicapped cerebral palsied children. This is understandable when consideration is given to the diversity of handicaps that the children have. Thus, while remedial work aimed at improving those aspects in which the child was retarded, records showed that some children failed to respond in certain respects. In such cases it was considered profitable to concentrate on developing the abilities which were normal, and so help them to compensate, to some extent, for the limitations in other directions.

CLASSES

As already explained on page 118, two classes were formed, and children were allocated to them on a basis of mental age rather than of chronological age. The composition of each class and its curriculum follow.

OUTLINE OF CURRICULUM FOR CLASS I

Composition of the Class

Class I consisted of ten children, of whom details are given below. *None of these children could walk alone.*

GROUP A *Inco-ordination of hands*	C.A.	M.A.	GROUP B *No hand defect*	C.A.	M.A.
Nancy	5·10	5·4	Peggy	6·8	4·10
+ *Defective speech*			+ *Defective hearing*		
Jill	6·4	6·6	Brenda	6·1	5·4
Ken	5·8	4·4			
Sam	7·2	4·8			
+ *Defective vision (almost blind)*			+ *Defective speech and vision*		
Jack	6·11	5·6 (approx.)	Carol	5·8	5·7
+ *Defective speech, vision and hearing*					
Kate	5·6	4·4			
Ron	6·5	5·9			

The chronological ages of the ten children ranged from five years six months to seven years two months and the mental ages from four years four months to six years six months. All were severely handicapped: none of them could walk alone; seven had inco-ordination of the hands in a greater or less degree; four had a defect of vision (one being almost blind); six had a speech defect (one girl's speech being confined to a few half-whispered monosyllables); and three had a hearing defect.

To construct a syllabus for such a group was no easy task but the first essential was obvious. The experience of all the children had been so narrow that it was necessary to provide experiences by every means available. Besides the activities described in the previous chapter, many others were introduced

PLATE 4 Occupational therapy

to help the children to make use of their powers of observation, judgment and reasoning. Naming and describing objects in the room, in the garden or in a picture; recognising similarities and differences by sorting beads or cotton reels; cutting out shapes or boldly outlined figures; fitting together jigsaw puzzles containing a few large pieces; these and many more activities helped to build up, through a combination of the sensory and the concrete, a background of experience on which to draw when formal teaching began.

Writing[1]

Writing was possible only for those children who could hold a pencil or crayon; sometimes it was advisable to give the child a thick pencil or to build up the pencil to a suitable thickness by covering it with papier mâché. Scribbling and pattern-making in various coloured chalks or pencils were followed by the formation of round letters and then gradually by the others. Unlined paper and large letters were used at first, letting the child trace over with finger, and then pencil, the shape of the letter being taught. It was found helpful for each letter to be connected with a meaningful word, *e.g.* when teaching 'o' to connect it with the word 'orange'.

When Peggy had difficulty in learning the shape of a letter she was given a large sandpaper letter and helped to trace over it with her finger; next she made the same shape on the table, then traced over a copy on her book and finally attempted to copy the letter in pencil and chalk.

As soon as a child was able to form a few letters he copied a complete word beside a picture so that his work retained an interest motive. Copying sentences was introduced as soon as the child could attempt this.

Writing between widely spaced lines followed the use of plain paper, and writing was kept large for a considerable period as these children often had difficulty with the finer movements, even when they appeared to have normal control of the hands and fingers. Children who had a hand disability found it necessary to have their paper fastened to a board so that it would not slip about; this was important for the athetoids and ataxics, in both classes.

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[1] Reading and Number are discussed in the next chapter.

Stories, Scripture and Dramatisation

This class exhibited all the normal child's interest in stories and even those with the most severe physical handicaps were anxious to take part in the dramatisation. So much did they enter into the spirit of the plays that, watching them, one hardly realised that they were not actually moving about and 'doing' all the things they were supposed to be doing. Even the most handicapped could be given a part, and as the children were all familiar with the disabilities of their companions, no one worried if a girl took an undue time to enunciate a few words. They were so pleased with their own parts that no one felt self-conscious or critical of others.

The therapeutic value of the dramatisation periods was amply illustrated in the case of Ken. Ken (chronological age five years eight months, mental age four years four months), who was badly handicapped, was so spoilt and pampered that he was almost completely dependent on his parents. When he first came to the school he cried frequently and was jumpy and afraid; when his classmates dressed up for a little play he wept and clung to his mother. Gradually, however, as dramatisation became an everyday event in his school life he began to take an interest in what was occurring and even to take part himself. As his speech was not handicapped he found there was something at which he could succeed and this helped his self-confidence. His conversation, till then extremely erratic and voluble, became more disciplined, his attention span increased a little, his concentration was decidedly better and he began to read. After some months, not only did he enjoy dramatisation but he asked to play leading parts; at these times his speech was always clear and he would sing alone before the class.

Recitation and Singing

In these subjects pupils were taken individually and in groups, and the children showed evident delight in these periods. Percussion band was also taken with the children whose treatment permitted them to take part. Instruments were selected to suit each child's disability and those who could not participate actively enjoyed watching the others. For some singing periods the two classes joined together, to the enjoyment of all.

Free Activity

Perhaps the most valuable period in the day for the younger members of the school was the free activity period, when they could carry out in miniature many of the things that grown-ups do. By a little ingenuity the children were enabled to accomplish a large proportion of the things done by normally equipped children and they played alone or in groups according to their desires.

The study of the histories of these cerebral palsied children showed that they had been shut off from many of the happenings of the outside world and had missed the vital play of the normal child. In this free activity period they found a means of self-expression as well as one of miniature life experience. The Play House, the Doll's House, the Sweet Shop and the Milk Bar provided a means of emotional release where they learned to relax and play freely. Here they carried out activities that previously they had only watched; dolls, animals, furniture, water, paint and scissors had to obey their desires and much pent-up aggression was released through this medium.

It was noticeable that at first their play was stilted and uninteresting, but as time went on and with tactful suggestions to direct them, they gradually became engrossed in their activities and signs of initiative began to appear. Plate 5 (facing page 137) shows four of the children during a free activity period.

It was interesting to see how popular were the games of 'hospitals' and 'treatments'; it was a common sight to see a child with a doll lying flat on the table while she lifted first its legs alternately and then its arms, not speaking a word but looking intently at the doll, just as the therapist did with her in the treatment sessions.

Nature Study

Nature talks were taken in the form of simple observation and discussions of everyday happenings. The aim was not only to impart knowledge to the pupils but even more to help them to be more observant. This is a much more important asset to the handicapped child than to the physically capable one, as he depends for much of his knowledge and information on his own observation and analysis of what he sees in his environment.

Children were encouraged to bring nature specimens of their own from home or from week-end outings, and these were shown to the class, the owner being allowed to talk about her 'find'. The nature lesson was thus linked with oral composition. Charts and sand trays of animals and birds, brought to or made in school, were found useful adjuncts to these lessons.

News Period

In the early days of the school the children were mostly reticent about what happened outside the classroom but one or two talkative members of the class, like Peggy and Ken, set the example and soon this period became a vital one in the day's routine, all members being keen to take part.

At first the children seemed surprised that others did the same things at home as they did and this increased the bond between them; they became deeply interested in their classmates' families and private interests—a very good thing for cerebral palsied children, especially the spastics, some of whom were inclined to be self-centred and introspective.

One pupil, who lived in a hospital on account of the undesirability of his home, was a quiet boy of seven. During news period he sat silent, never attempting to take part, probably because in the monotony of his limited environment he found nothing worth reporting. Then he went for two weeks' holiday to the seaside and on the first day back at school a transformation took place. The formerly reticent boy, bubbling over with excitement, had a store of 'news' which lasted not only that morning but for some weeks.

PLATE 5 Free activity of the junior group

OUTLINE OF CURRICULUM FOR CLASS 2

Composition of the Class

These children were *unable to walk alone.*

GROUP A

Inco-ordination of hands

+ Defective vision	C.A.	M.A.
Katherine	10·6	8·6
Rita	8·0	6·6
+ Defective speech and hearing		
Brian	9·10	11·0

GROUP B

No hand defect

+ Defective vision	C.A.	M.A.
Elsie	7·1	7·6
Ernest	7·0	6·10

These children were *able to walk.*

GROUP A

Inco-ordination of hands

	C.A.	M.A.
Edward	11·10	9·3
+ Defective speech		
Mary	7·4	6·5
Oscar	11·11	10·1

	C.A.	M.A.
+ Defective vision		
Betty	7·0	7·0
+ Defective speech and hearing		
Tilly	8·3	7·0

From the data given above it will be seen that the chronological ages of the children in Class 2 ranged from seven years to eleven years eleven months, and the mental ages from six years five months to eleven years. The ten children fell into two fairly distinct sections, four in the older section and six in the younger. Five could not walk without assistance; eight had some degree of hand disability; five had defective sight (one being a very complicated case of dual vision); four had a speech defect; and two had a hearing defect.

All the pupils in this class were attending school prior to being admitted to Carlson House, but only one of them was getting special education and treatment in a school for cerebral palsied children, and he was not making the progress expected owing to emotional conflicts due to being away from home. Five of the pupils were attending ordinary schools and four were at schools for physically handicapped children. All ten pupils were retarded in school work.

Once the initial settling-in period was over, diagnostic and attainment tests were given to get estimates of the children's individual attainments in the basic subjects in order to plan schemes of work.

Writing[1]

With the wide range of hand disability in this class, writing lessons were necessarily of an individual nature and varied from writing patterns in chalks and pencil to cursive writing of a tolerably good standard. A child's mastery of fundamental information depends to some extent upon his experience of visual presentation of it, and for the cerebral palsied child whose ability to write is grossly limited there are two ways we can help him in this respect. Firstly, someone else can be a 'writer' for him and secondly, he can be taught to use a typewriter, either the ordinary kind or an electric machine. Oscar, an eleven-year-old ataxic, could do script, but as it was very irregular and not very legible he was encouraged to try cursive writing. This, however, proved to be even worse, as the boy's jerky movements prevented him from making the smooth joinings of letters to form words. For this boy the best solution seemed to be the use of a typewriter, and lessons in typewriting were begun.

English

The English syllabus embraced the usual subjects. Oral composition took the form of daily news periods, storytelling, making riddles, talks on hobbies and interests, nature talks and so on. The amount of written English and composition varied with the individual's ability to write or to type. The children produced a four-page cyclostyled paper *Clarion*[2] which appeared quarterly and contained articles and poems written by the pupils. This was excellent for the children from the point of view of their education and of the development of their personalities.

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[1] Reading and arithmetic are discussed in the following chapter.

[2] A specimen copy of *Clarion* is given in Appendix B.

Literature

Poetry and literature were treated in a full and comprehensive manner, using an assortment of material to suit the interests of children of these ages. Dramatisation was supplemented by puppetry, the children making the puppets during handwork periods.

Even the most handicapped were encouraged to participate in the puppet shows, and often one puppet's performance was due to the combined efforts of two children, as when Brian said the dialogue while Betty worked the puppet. The synchronisation of speech and movement was very well executed and the sense of partnership involved in such situations was good social training for the children.

Nature Study

This class made a special study of nature and through this intense interest strong motivation was provided for several other subjects such as reading, composition, art, and decorative handwork. The schoolroom overlooked the garden and a bird table was constructed just outside the window in full view of the class. A nature table and aquarium were also popular assets. All kinds of specimens were collected and discussed; pupils learned how to look for details in reference books and the encyclopaedia. Specimens were identified, labelled and written about in nature diaries, with suitable illustrations. Field work was taken as far as possible in the school grounds and on outings.

Art and Handwork

Drawing and painting are activities not easily carried out by children whose hand control is weak. Although this handicap characterised three-quarters of the children, it was felt that expression through art was so vital to personality development that every effort should be made to provide opportunities for drawing and painting. Special adaptations in materials decreased some of the effects of physical handicap. But along with weakness in sheer manipulatory power went, as has earlier been noted, paucity of experiences and lack of exercise of colour sense.

It was necessary therefore to give the children practice, in the early stages, in manipulation of tools, and to introduce such pattern work as would enable them to develop their colour sense. The use of colour certainly had an appreciable effect upon them—they were delighted with some of their patterns—and undoubtedly the earlier stages of this work had the effect of loosening them. From this early 'play' the work proceeded through attempted expression of very simple themes intimately related to the pupils' immediate experiences.

To begin with, although the work was very limited in imaginative expression, it was useful to the children as individuals. They felt that they were doing something 'all on their own'.[1] They were not afraid of making a mistake and they went ahead with their attempts according to the satisfaction they were obtaining. There were sufficient indications in the art to show that, for these handicapped children, opportunities to express themselves through colour is of very great value in encouraging them to greater spontaneity and increased extraversion.

It was interesting to see the action portrayed in some of the pictures by children who could not walk, no doubt expressions of their own fantasies. A similar instance is described by Norfleet thus: 'It is surprising how much real rhythm is expressed in the designs. One boy who could not walk alone did all the designs for the school magazine cover. Each one revealed a feeling of motion: birds in flight, trees moved by wind, storm, rain and the like. The creativeness found in his art revealed what the individual really wished to do or be.'[2]

Handwork included modelling, sewing, knitting and weaving. The weaving was particularly interesting because the children themselves worked out the whole project. They made the looms from miscellaneous scraps, having first worked out what they required and how the frames would be constructed. As each pupil planned his own experiment and worked it out to suit his particular disabilities, the result was a varied group of looms showing adaptations of different kinds. When anyone was having difficulty over an adjustment of the apparatus a companion volunteered suggestions and together they developed the new idea. Plate 7 (facing page 148) shows the two eldest boys at work on their looms. Both boys had a hand disability and displayed considerable ingenuity and persistence in overcoming the problems connected with the weaving.

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[1] Ruth Dunnett makes the same observation in *Art and Child Personality* (Methuen, 1948), in which she describes the development of art work during five years at Whiteacre Camp School for boys, some of whom were maladjusted.

[2] Grizzelle Norfleet, Emotions and Our Mental Hygiene Progress, *The Physical Therapy Review*, May-June 1948

Miss Ash, the teacher, indicates the value of this experiment when she writes: 'What had they gained from it? They had learned to do things for themselves and this was something new, especially for the several who, badly crippled from birth, had had perhaps too much care and had not been allowed to do and to make. They had made looms which really worked. They had succeeded in making something useful; it may have been a mat for a doll's house, a purse for themselves, a front for a cushion for mother, a bonnet or a scarf: whatever it was it had been created by the individual.'[1]

History, Geography, Science, etc.

It is obvious that where the amount of time given to school subjects is curtailed by pupils' absence for therapy some modifications are also necessary in the treatment of curriculum subjects. If the plan of work discussed in these chapters is followed it forms a firm foundation for general education. There will, however, be some periods left which may profitably be devoted to history, geography, or social studies, music, and general science. These subjects, taught by modern methods, can be made very interesting and informative, especially for handicapped children who have long periods of enforced inactivity.

In this connection a selective use of the radio, supplemented by the published pamphlets for schools, can be most effective.

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[1] Beryl Ash, Weaving with a Few, *The Special Schools Journal*, Vol. 39, No. 1, February 1950, p. 17

Similarly, in Australia we find the Correspondence School pamphlets useful for extending and testing work taken in class.

The project is an interesting method for stimulating the pupils to explore other sources of information, such as a children's encyclopaedia and educational magazines. Some of the class will have more facility in the actual making or arranging of the project materials, while others will perhaps read more fully and work out schemes for the development of the plans. One of the projects taken with the senior class at Carlson House was the building of a model radio set. Again, some of the children were taken for an aeroplane trip over the neighbouring counties and thereafter an exciting method of testing the geography of Europe was to pretend one of the children was at the controls of a plane while another 'broadcast' a description of the country over which a third child's ruler passed on the wall map.

In these ways, not only do we extend the children's knowledge but we put in their hands the means of developing future leisure interests. One older cerebral palsied boy, whose physical disabilities prevented him from even knocking in a nail, was yet able to design and direct the building of a model ship complete with electrical installation.

Radio and Television

Because of physical limitations many cerebral palsied children are precluded from full participation in the physical activities of normal children and for this reason they should be given every opportunity to build up interests on the intellectual side. Thus the radio and television have a special value in the general education and leisure time preparation of these children. In school and in the home teacher and parent should directly plan to enable cerebral palsied children to make the fullest use of these two modern sources of information and pleasure. We can help children not only in the selection of programmes but in preparation for obtaining the greatest benefit from certain programmes. In home and school help can be given by encouraging older children to do a certain amount of preparation for selected programmes—a point which applies particularly to hearing and viewing material concerned with dramatic presentations, travel, natural history and musical appreciation. Children can be introduced to the attractive pamphlets prepared by the School Broadcasting Council and there are programmes that will permit of some interesting follow-up work by the children—searching for information, making models, expressing ideas through painting or drawing, etc. In this way we can use the radio and television partially to compensate for the loss that many children suffer in terms of limited physical activities.

CHAPTER XVI

READING AND ARITHMETIC WITH CEREBRAL PALSIED CHILDREN

THE results of the survey of 354 cerebral palsied children between the ages of three and fifteen years reported in this research showed that, although half the children had I.Q.s within a range similar to that found in the ordinary school population, the standard of achievement in reading was very much below that expected. In those cases where arithmetical achievements were investigated the results were even worse. For example, of the twenty pupils in the first year's experimental group at Carlson House, none had number attainments equal to those expected from his mental age, although Betty, chronological age seven years, whose revised I.Q. proved to be 126, was working up to her chronological age level.

During the research, observations indicated that the teaching of cerebral palsied pupils was characterised by a lack of attempts to maintain satisfactory standards in the basic subjects. The attitude of educators seemed to be that, while education should be provided for these children, they need not be expected to put forth effort to attain normal standards of work. Only in a few cases were children given the opportunity and encouragement to work up to levels commensurate with their mental and physical abilities.

At Carlson House School an investigation was undertaken to determine the success in basic subjects that could be expected of cerebral palsied children of varying degrees of mental and physical ability.[1] While performance was, of necessity, governed by the

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[1] For the Record Booklet used at Carlson House see Appendix C. In this booklet was entered the vital information concerning the pupil's physical, intellectual and emotional progress. In addition to this, teachers and therapists kept more detailed charts of week-to-week improvement. Records were also made in the form of: (*a*) recordings of children's speech on admittance to the school and at intervals thereafter and (*b*) films showing the children shortly after entry to the school and after a considerable period of treatment.

PLATE 6 Painting as a basis for conversation

limitations of the pupil's mental and physical equipment, each child was encouraged to develop to the full his potential powers. In this way it was hoped to avoid adding the extra and unnecessary burden of ignorance to the inescapable handicaps of cerebral palsy.

READING

In America Carlson drew attention to the unsatisfactory reading habits of the cerebral palsied when he wrote: 'In over 500 'teen age cerebral palsied—who had I.Q.s within normal limits and no reading disability—I found only ten who had read more than three books. One athetoid, who had read several hundred books, attributed her physical progress to reading. She could converse on many subjects and found it easy to direct her thoughts to ideas that controlled emotional factors interfering with muscle control.'[1]

It would be difficult to over-estimate the importance of reading in the life of the cerebral palsied child and adult. In addition to the dependence that the normal person has on his ability to read, it will be realised that the cerebral palsied, particularly if he has moderate or severe physical disabilities, depends for a large proportion of his knowledge and experience on what he can obtain from printed material of various kinds. Moreover, his disability prevents him from participating in most of the leisure pursuits of others, and hence emphasises the need for him to be able to read fluently for enjoyment as well as for the assimilation of knowledge.

In this research, one case of particular interest illustrates this point. Eric was a boy of fifteen who was so severely handicapped with athetosis that he had never been to school. Yet, in spite of his inability to walk or use his hands, and in spite of being handicapped by a very severe speech defect and constant, involuntary movements of the whole body, he had acquired a fund of general knowledge considerably superior to that of the average fifteen-year-old boy. This had been accomplished through reading (taught by his mother) and supplemented by listening to radio programmes. Not only did his ability to read well provide a pleasurable leisure occupation, but his acquirement of, and ability to apply, the knowledge he gained made him an acceptable companion to other boys. These latter, being physically well equipped, could make, under his instructions, models of which they were themselves not capable of planning the construction. In this way he not only won their respect, but his own self-esteem was maintained.

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[1] Earl R. Carlson, Give Them Education, *The Crippled Child*, December 1947

Reading Progress of the Twenty Pupils in the Experimental Group at Carlson House compared with a Control Group

The Experimental Group

All the pupils of Carlson House who could read were given the Schonell Graded Word Test on admittance and again at the end of twelve months. At the first testing the ten children in Class 1, and Mary from Class 2, could not recognise one printed word, even from Burt's Graded Vocabulary Test[1] which was used as a supplementary test in certain cases. Hence it was necessary to test them again when they had begun to read; for most of them this was after a period of three months in the school, but four children (Brenda, Peggy, Kate and Jill) started reading at a later date than the others and this explains why the period over which their recorded progress was made was less than twelve months.

Table XXVIII gives the chronological, mental and reading ages of the twenty Carlson House pupils at the first testing and again at the re-test after a period of twelve months. It will be observed that only three of the children had not succeeded in learning to read. Of these, Jack was almost blind and could not distinguish even the largest print and Ken, whose mental age at the final testing was 4 years 6 months had just begun to recognise word patterns. Sam (M.A. 5 years 9 months) made no response to the printed word.

The average increase in reading age for Class 1 was 2 years and for Class 2 it was 2 years 1 month, the greatest improve-

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[1] Reading ages four to five obtained from Burt's Graded Vocabulary Test, which has an introductory group of words, gives a somewhat arbitrary reading assessment extrapolated below the usual 5 + level. Such reading ages should not be regarded as accurate objective results; they simply indicate that the pupils exhibit a very low level of word recognition.

TABLE XXVIII[1]

Reading Progress of Twenty Pupils of the Experimental Group over a Period of Twelve Months

S. = Spastic Ath. = Athetoid A. = Ataxic

C.P. type	Case	1st test			Re-test after 12 months			Gain	
		C.A.	M.A.	R.A.	C.A.	M.A.	R.A.	Yrs.	Mths.
	Class 2								
S.	Elsie	6·11	6·10	5·6	7·11	7·10	9·10	4	4
S.	Betty	6·10	8·7	5·4	7·10	9·10	9·0	3	8
S.	Rita	8·0	5·11	5·6	9·0	6·8	8·4	2	10
S.	Edward	11·8	9·0	8·0	12·8	9·9	10·0	2	0
S.	Ernest	7·4	7·4	5·5	8·4	8·4	7·4	1	11
S. Ath.	Katherine	10·8	9·0	5·5	11·8	9·9	6·11	1	6
Ath.	Brian	10·2	13·6	11·4	11·2	14·10	12·11	1	7
S. Ath.	Mary	7·7	6·1	4·1	8·7	6.10	5·4	1	3
Ath.	Tilly	8·3	7·11	5·11	9·3	8·11	6·9		10
A.	Oscar	11·9	10·0	7·7	12·9	10·10	8·5		10
Average		8·11	8·5	6·5	9·11	9·4	8·6	2	1
	Class 1†								
S.	Nancy	6·1	5·10	4·6	7·1	6·10	7·5	2	11
*S.	Brenda	6·6	5·10	4·2	7·4	6·7	6·10	2	8
S.	Carol	5·11	5·9	5·4	6·11	6·8	7·6	2	2
*S.	Peggy	7·0	5·0	4·1	7·10	5·6	6·1	2	0
S.	Ron	6·7	6·0	5·4	7·7	6·11	7·1	1	9
*S.	Kate	5·11	5·9	4·1	6·9	6·6	5·4	1	3
*Ath.	Jill	6·10	6·9	4·1	7·7	7·6	5·2	1	1
Average		6·5	5·10	4·6	7·4	6·8	6·6	2	0
S.	Ken	5·8	3·10	nil	6·8	4·6	nil	Beginning to read	
S. Ath.	Jack	7·0	5·3	nil	8·0	6·0	nil	Almost blind	
Ath.	Sam	7·5	5·0	nil	8·5	5·9	nil		

* None of the children in Class 1 could read on entry to Carlson House, fifteen months prior to final testing.

† In these cases the period during which the progress was measured was less than twelve months, because it was less than twelve months since they began to read.

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[1] In this table the revised mental ages of the children have been given as being most reliable. This will explain some variations from those given elsewhere.

ment being those of two six-year-old girls in Class 2, Elsie[1] making a gain of 4 years 4 months and Betty a gain of 3 years 8 months in reading age. (Reasons for variations in the success of different pupils are discussed later in this chapter under the section dealing with physical, sensory and speech handicaps as they affect reading ability.)

The Control Group

Meanwhile, from the children examined during the survey a number of cases were selected as nearly as possible like the Carlson House cases as could be found. The children were paired for chronological age, mental age, reading ability and physical, sensory and speech handicaps. It will be realised that, having regard to all these variables, the pairs are by no means perfect; indeed in almost every case the member of the control group was less handicapped than that of the experimental group. It will be observed that, of the control group, nine attended ordinary schools, three attended schools for physically handicapped children and five were too handicapped or too isolated to attend school.

No case could be found to pair with Katherine, who had dual vision, nor with Jill, who was a very severely handicapped athetoid of normal intelligence but whose speech was limited to almost inarticulate monosyllables. For this reason Kate and Jill are omitted from the list for paired comparison. As Jack was almost blind, as well as having very severe leg and hand disabilities, he also is not included in Table XXIX. This reduces the number in the experimental and control groups to seventeen cases each.

From Table XXIX it will be seen that the average chronological age for both groups of seventeen children was 7 years 7 months (range 5 years 8 months to 11 years 9 months and 5 years 6 months to 12 years respectively); the average mental age for the experimental group was 6 years 11 months and for the control group 6 years 8 months. The average reading age of each group at the first testing was 5 years 9 months, but,

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[1] Elsie read twenty books during these first twelve months at Carlson House.

PLATE 7 Boys using hand-made looms

whereas the readers in the experimental group at Carlson House made an average improvement of 2 years 2 months, the average for the control group was only 1 year 1 month. This difference between the mean improvement made by the experimental group and that made by the control group is statistically significant, that is, it was not due to chance. Moreover, at the end of the twelve months, only two members of the experimental group, Ken and Sam, were unable to read as against six non-readers in the control group.

Table XXIX

Comparison of Improvement in Reading made by Seventeen Children in the Experimental Group and Seventeen Children of Similar Mental and Physical Equipment in the Control Group

Experimental group				Control group				Gain in 12 months			
	C.A.	M.A.	R.A.		C.A.	M.A.	R.A.	Expt.		Control	
								yrs.	mths.	yrs.	mths.
Elsie	6·11	6·10	5·6	P.W.	7·8	7·10	5·2	4	4	1	9
Betty	6·10	8·7	5·4	M.M.	6·10	7·1	6·0	3	8	1	6
Rita	8·0	5·11	5·6	C.C.	8·6	6·5	5·6	2	10		10
Edward	11·8	9·0	8·0	W.B.	11·2	9·5	7·1	2	0		5
Ernest	7·4	7·4	5·5	R.B.	7·4	7·0	5·6	1	11		5
Brian	10·2	13·6	11·4	R.B.	9·0	9·2	8·0	1	7	1	0
Mary	7·7	6·1	4·1	M.B.	8·2	6·2	4·1	1	3	1	7
Tilly	8·3	7·11	5·11	P.G.	8·3	6·8	5·10		10	1	3
Oscar	11·9	10·0	7·7	P.V.	12·0	10·4	7·0		10	1	0
Nancy	6·1	5·10	4·6	J.Y.	6·3	6·3	4·8	2	11	1	5
Brenda	6·6	5·10	4·2	A.E.	5·8	5·7	nil	2	8	nil	
Carol	5·11	5·9	5·4	D.G.	5·6	5·5	nil	2	2	nil	
Peggy	7·0	5·0	4·1	M.H.	7·0	5·2	nil	2	0	nil	
Ron	6·7	6·0	5·4	J.B.	6·8	5·10	4·10	1	9	1	0
Kate	5·11	5·9	4·1	P.B.	5·10	5·6	nil	1	3	nil	
Ken	5·8	3·10	nil	W.S.	5·7	3·11	nil	nil		nil	
Sam	7·5	5·0	nil	R.C.	7·3	5·3	nil	nil		nil	
Average	7·7	6·11	5·9*		7·7	6·8	5·9*	2	2	1	1

* Reading age averages and gains are calculated for readers only.

In addition to the seventeen children in the control group, a further eight were tested as being closely similar to the experimental group, although most of them had considerably less physical handicap. When figures for these two control groups were put together the picture was very little different for the twenty-five cases; here the average chronological age was 7 years 7 months and the average mental age was 6 years 8 months. The average reading age on the first test for the readers (sixteen in number) was 5 years 9 months and the average gain 1 year 2 months. Nine children in this larger control group had not learned to read.

Although these results refer to only a small number of cases they indicate strongly that cerebral palsied children whose intelligence lies within the range of the ordinary school population and whose sensory defects do not prevent them from benefiting from class teaching can make very satisfactory progress in reading. It also suggests that such *children are likely to benefit more from the special instruction given in a school for cerebral palsied children* than in the larger and more varied group in an ordinary school or special school for physically handicapped children.

However, the difficulties that present themselves in the teaching of cerebral palsied children should not be minimised. Rather should we ascertain all the disadvantages, examine the assets in the case and then plan our teaching and remedial programme accordingly. In the present research the children studied formed a fairly representative group with handicaps due to cerebral palsy. Some of the chief factors are discussed below, with examples from the experimental group at Carlson House.

Physical, Sensory and Speech Handicaps as they Affect Reading Ability

(*a*) *Physical Handicaps*

The three physical handicaps that were found to have the most serious effect on the child's ability to learn to read were inability to hold the head erect, disability of the hands and the involuntary movements of the body and head which characterise moderate and severe cases of athetosis. When a pupil has difficulty in holding his head erect or needs artificial means, such as supports on his chair, to enable him to do so, he is under a continual strain during reading lessons. Moreover, the fact that his head wobbles at intervals affects his concentration as well as his visual perception. Somewhat similar is the athetoid child whose body begins to jerk and writhe when he puts forth effort of any kind. The focussing power of the child is reduced and his vision shifts from one line to another upsetting the continuity of perception that is necessary in both learning and practising reading.

A partial solution to this problem and to the nausea experienced by ataxics who concentrate on close work for any period of time might lie in the use of film strips[1] for teaching reading to these children.

This unsteadiness of the head was a factor which limited the improvement in reading of three athetoids, Tilly, Mary and Brian.

Although severe disability of the hands, preventing pupils from writing, probably affected reading progress to a certain extent, in that these children were denied the advantage of learning through the kinaesthetic sense, this factor did not appear to be as important as the other two mentioned above.

(*b*) *Sensory Handicaps*

During the research it became evident that sensory handicaps play a more important part in limiting the child's ability to learn to read than was at first apparent.

(i) *Defective Hearing.* Hearing defect may show itself either in loss of general auditory acuity in one or both ears, or in lack of discrimination at certain frequencies. Where general hearing disability is severe the child needs special instruction in a school for the deaf, preferably one that provides for children with multiple handicaps.[1]

As the research progressed it became clear that slight general hearing defect or loss on certain frequencies often passes unnoticed until someone begins to make a special study of the case. In the latter type of deafness only certain ranges of pitch are affected, so that, while the child hears most noises, he does not hear some parts of speech; *e.g.* consonants like 's', 'f' and 'th' and the vowel 'e' are frequently not distinguished. The result is that, while parents consider the child's hearing is normal, in reality the speech of others is partially unintelligible to him.[1] Hearing defects are especially prevalent among athetoids and sometimes such children have been unjustly dubbed mentally defective.[2]

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[1] Oliver and Boyd, publishers in Edinburgh, have now produced film strips of the *Happy Venture Readers* which are used in British and Australian schools. Obtainable from Educational Publications Ltd, 17 Denbigh St., London, S.W.1. Australian Agents: Literary Educational Supplies, 271 Canterbury Rd., Canterbury, N.S.W.

[2] See Condover Hall School for the Blind by S. O. Myers, *Educational Review*, Vol. 1, No. 3, 1949.

In the Carlson House experimental group audiometer tests[3] revealed that Mary, Brenda, Ron and Kate had a degree of deafness which had been quite unsuspected, and this information influenced the teaching of these children. Brenda's delayed response to the spoken word had previously suggested that she was not as bright as her intelligence test had indicated, but her hearing defect explained the inconsistency. The defective speech of Mary and Kate was aggravated by the hearing defect, and this dual handicap held up their reading progress for some time. Mary's progress was so poor that she was transferred to Class 1, where visual aids and flash cards helped her to overcome the early difficulties of learning to read.

(ii) *Defective Vision.* Experience during the research showed that slight or moderate defective vision, for which the wearing of glasses can compensate, does not have a serious detrimental effect on reading attainments. There are, however, certain defects of vision which are a severe handicap to the pupil's progress in school, and for which glasses can be of no help. Two such cases were in the Carlson House experimental group. Katherine had dual vision, which made focussing difficult except at a certain distance and angle. Arrangements were made, on the specialist's advice, to have an operation performed to remedy this, but in the meantime Katherine could do little in the way of reading except from books containing very large print. Consequently, when first tested, at 10 years 8 months (M.A. 9), her reading age was 5 years 5 months. Books prepared for sight-saving classes[1] were introduced and Katherine began to make progress in reading and to be interested in the subject. For Katherine, Ron and Jack book-rests were used to support the book at a convenient eye-level.

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[1] For a consideration of this special problem see *Aphasia in Children* by A. M. Ewing, Oxford Univ. Press, 1930, and *The Child's Hearing for Speech* by Mary D. Sheridan, Methuen, 1948.

[2] When Brian was very small his parents had been informed that he was mentally defective and should be put in a home as nothing could be done to improve his condition. Brian's I.Q. is 133.

[3] Audiometer tests and medical inspection of nose, ear and throat were done with all the pupils; where the need for operative or treatment measures was discovered these were carried out as soon as possible.

Jack, of whom mention has already been made, was an unusual case. When trying to see anything, he cocked his head and his eyes roved about, giving him a fleeting glance from the corner of his eye. He could see large or moving objects but nothing in the nature of print. Gesell, describing a similar case says, 'The visual defect is due to an impairment of macular vision, while peripheral vision remains more or less intact.'[2]

All the children at Carlson House had an examination by the eye specialist, with the result that three cases of unsuspected eye defect were discovered. Carol, who had a 'lazy' eye, was required to wear an eye-shield over the good eye for some months and this temporarily slowed up her reading progress, which had been extremely rapid.

But some eye defects may not be revealed in an examination. Phelps refers to such cases thus: 'Ocular tests may show normal vision, but loss of control of the extraocular muscles, involved in either spasticity or athetosis, may seriously interfere with reading. With the ataxics nystagmus is common, and this also may be a handicap to reading.'[3]

Oscar was an ataxic who exhibited characteristics of this type. He found close fixation difficult as it aggravated his dizziness;

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[1] With reference to this point see the excellent material produced by the progressive School Book Publications Department of the New Zealand Education Department. The School Papers issued in three different grades of difficulty for children with normal sight are enlarged in type approximately four times the size for the New Zealand sight-saving classes.

[2] Arnold Gesell and Catherine Amatruda, *Developmental Diagnosis, Normal and Abnormal Child Development*, p. 249

[3] Winthrop M. Phelps, The Management of the Cerebral Palsies, *J. of the Amer. Med. Assn.*, Vol. 117, November 1941, pp. 1621-25

this made book concentration useful only for short periods. If continued for longer the dizziness leads to a feeling of nausea.

(*c*) *Speech Handicaps*

Defects of speech have an important bearing on ability to read, the type of defect varying according to the form of disability.

Spastics. With the spastic, the throat and tongue muscles may become tense, and the lips do not move freely when attempts are made to form sounds. Irregular breathing often aggravates the condition and hence training in correct habits of breathing and in relaxation of the throat and tongue muscles is a necessary preliminary to learning to read. Kate was an example of this type of disability, which was complicated by the hearing defect already mentioned, and it explains her slow progress in learning to read, despite her normal intelligence. It also explains the discrepancy between her original I.Q. finding of 78 and the revised one of 97.

Of the twelve spastics in the research group, three others had a slight speech defect which has now been almost completely overcome. Carol's stammer had an emotional basis. When she first came to school she was highly-strung and excitable. Although her hands were not disabled she had used them very little and hand dominance had not been stabilised. During this period of stabilisation Carol was disturbed and nervous, chewing her handkerchief whenever her hands were not occupied. The results for determining natural handedness were not conclusive and Carol was asked to use her left hand for a week. One day during this week she glanced up from her writing, looking flushed and confused, and said, 'I feel all mixed up when I write with my left hand.' From then on Carol was encouraged to use her right hand and she quickly gained confidence as she began to read and to write. Gradually she became less tense and overcame the handkerchief chewing as she had more to think about and to do. She was bright and keen to learn, besides being one of the happiest children in the school.

Athetoids. In athetoids, speech defect, with or without some hearing loss, is very common. With uncontrolled tongue action, bodily movements and difficult breathing, speech tends to be lacking or to be incoherent. Relaxation aims at eliminating the facial contortions and the involuntary spasms of the tongue, while encouraging correct breathing habits.

The experimental group included four pure athetoids, all of whom exhibited this speech characteristic, and in every case the effect was seen in the reading attainments of the child. Sam, whose speech defect was the least severe, was of subnormal intelligence (I.Q. approximately 70) but the other three had normal or supernormal intelligence, their revised I.Q.s being: Tilly 96, Jill 99 and Brian 133. Tilly came from a very poor home and neighbourhood where speech patterns set an undesirable example, and this, added to her own athetoid handicaps, combined to limit reading progress. Her improvement over the twelve months' experimental period was 10 months, only one other reader making such poor progress. Brian made 1 year 7 months' improvement in reading age over the period, bringing his reading achievements almost up to the level of a thirteen-year-old's (his chronological age then being 11 years 2 months) and this was considered most satisfactory, considering that, in addition to his severe speech defect, he had very severe disability of the hands and a moderate hearing defect, besides being unable to walk.

Jill has been mentioned in an earlier chapter as being so handicapped that she could not walk or use her hands, while her speech was limited to half-whispered monosyllables. When she first came to school she was prescribed a period of almost complete relaxation during which she took no active part in class lessons. Yet, during the twelve months following this period, she learned to read, despite her heavy handicaps. Indeed, during the time when she could not participate in class lessons she used to watch the others reading, and one day it was noticed that she was 'helping' Peggy with her reading exercise. Peggy would fit words together to form a sentence, whereupon Jill checked the result and made a sign with her head whether it was correct or not.

Ataxics. Oscar was a typical case of ataxia, with his lazy, thick speech and an attitude of inertia as though it were too much trouble to speak. The nasality was due to an inability to raise the soft palate when making sounds, and the thickness of voice was caused by a lack of muscle tone; he did not know the position of his tongue and this also increased the difficulties of speech therapy. It was necessary for Oscar to watch his reflection in the mirror and to copy the therapist's example by sight rather than by feeling where his tongue was and how his lips were placed.

Other Factors Affecting Reading Ability

In addition to physical, sensory and speech handicaps, cerebral palsied children may be affected by the other factors that hinder normal children in learning to read. Such factors are difficulties in auditory or visual memory, association of word and meaning, analysis and synthesis of words, directional attack on words and so on.[1] Examples of some of these occurred in the present research.

Teaching Reading to Cerebral Palsied Children

In Class 1, where none of the children could read, the modern method of teaching reading was found most satisfactory. This consisted of a preliminary enriching of the child's experiential background, described in an earlier section, followed by definite pre-reading preparation—discussion of pictures of Fluff and Nip, Dick and Dora, and so on—using the vocabulary of the reading material. This was followed by a combination of the sentence method and word-whole method of teaching reading. Children learned to recognise the meaningful sentences by their patterns, *e.g.* 'Nip is a dog', and then later to recognise the separate words.

With handicapped children, amongst whom range of intelligence, sensory powers and experiential background is even greater than amongst normal children, it is absolutely vital to use a series of reading books that has been scientifically compiled to enable every child to progress at his own rate and to gain *some* success. This provision is offered only by vocabulary-controlled reading books such as *The Happy Venture Readers.*[1] These have a careful vocabulary control through five books, beginning with forty-three new words in the Introductory Book and gradually increasing to a total vocabulary of 736 words by the end of Book IV. We found in our experimental school (and this has been borne out in many similar situations since then) that a vocabulary-controlled series ensures some success for *every* cerebral palsied pupil, no matter how handicapped he may be.

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[1] For a full description of these factors see *Backwardness in the Basic Subjects* by F. J. Schonell, Oliver and Boyd, 1942, Chapter IX.

Many learning devices were employed, such as flash cards, sentence matching, sentence building and completion, word matching (with or without pictorial illustrations) and games. These were followed later by sentence writing and answering questions from material supplied on a card.

Meanwhile, as the individual children were able to recognise sentences and words, they were given individual reading lessons from the first book of the series, which consists of the cards printed in book form. This ensured success and the child was given confidence to attack new words as they arose in the next book.

When it was found that a certain child needed individual variation of this method such changes were introduced. For example, Peggy (C.A. 7·0, M.A. 5·1) was making no response to the sentence plus word-whole method of teaching. She could not remember the patterns of words from one day to the next and so was failing completely where most of the class were succeeding. Her early efforts were further complicated by her parents' efforts to teach her to read by the alphabet method, but this was discontinued when the parents were tactfully requested to leave all teaching to the school staff.

It was decided to try the phonic method with Peggy—to teach her the sounds of the letters and how to build them up into words. The result was surprisingly good. She began to read and with success came the desire to excel; she asked repeatedly to be allowed to read in the free activity period and she derived considerable satisfaction from her success. At the end of six months her result in the Schonell Graded Word Test was C.A. 7 years 6 months, reading age 6 years. It was interesting, too, to observe the effect of her success on her behaviour in school. Peggy was an extreme extravert. A pretty, attractive little girl with bright eyes and a verbal fluency which belied her subnormal mental level (I.Q. 73), she was an only child who had been the centre of attraction in a doting household. When she came to Carlson House she continually sought attention by calling out or by requesting to be taken out for special testing. It was noticeable, however, that with the success gained in reading, her efforts to attract attention became less pronounced and confined themselves mainly to a desire to show off this new achievement.

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[1] *The Happy Venture Readers*, by F. J. Schonell and I. Serjeant, Oliver and Boyd, London and Edinburgh. The series also has carefully graded sets of card material for each reading book; these are most useful for consolidating learning and for revision. A supplementary series of readers, *Happy Venture Play Books*, also makes the task of providing for children of varying ages and abilities much easier.

The fact that some members of the class were reading from books acted as a great spur to the others, and before the end of the year all except Sam and Jack were reading from books, though Ken was not yet capable of recognising the words if presented outside their context.

Reading with Older Cerebral Palsied Children

Reading with the older cerebral palsied children at Carlson House followed the normal method used in ordinary schools but was supplemented and adapted as the need arose. At the beginning of the year none of the children evinced an interest in reading; it was just another lesson. It was obvious that some strong motivation was needed. This was obtained through the general class interest in nature study, the children being encouraged to make nature diaries and charts, to look up references in books, and so on. Notes were also made on their handwork lessons—how weaving was done, how puppets were made—and finally short plays were written for the puppet show.

The effect of success in reading on the temperament of a child was shown in the case of Rita, aged eight years. Rita could not walk, she had a hand disability and defective vision. Although she had attended an ordinary school prior to coming to Carlson House, her reading age at the beginning of the year was only 5 years 6 months and she had practically no knowledge of number. In school she sat all day slumped in her chair taking no part in class lessons and looking as though she was entirely devoid of thought and feeling. So successful were the teaching methods with Rita that by the end of twelve months her reading age had increased by 2 years 10 months, bringing it to 8 years 4 months, twenty months in advance of her mental age. Meanwhile her personality underwent a complete transformation. She became bright and communicative; in school she volunteered news and took part in discussions; she was happy in class and was heard singing at her work!

A novel means of motivating reading was introduced with this class by arranging for all the children to go to a city bookshop and help choose books for the class library. This entailed arranging for cars to transport the children and for the manager of the book department to free the elevator for their use. But the trouble taken was more than repaid by the delight of the children, most of whom had never been in a bookshop or selected a book, and by the incentive to reading that the visit provided.

Finally much depends on the nature of the material given to the children to read—grading of books is an important factor in ensuring success. With older cerebral palsied children we have had marked success by using books which combine a strong story element with the provision of information. For this purpose the attractively illustrated *Wide Range Readers*,[1] of which there are twelve books graded for pupils from reading ages seven to twelve, prove stimulating. Their interest is increased by original material dealing with topics such as the Great Trek, the history of writing, the boyhood of Leonardo da Vinci, the struggle of Madame Curie and her husband in the cause of science, the life of great artists like Pavlova and Jenny Lind. Children who have never wanted to read for themselves can be led to acquire a reading interest and at the same time to extend their general knowledge if care is taken to select reading material[1] suitable to their age and outlook.

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[1] *Wide Range Readers*, Green Series, Books I to VI, Blue Series, Books I to VI, by F. J. Schonell and P. Flowerdew, Oliver and Boyd, London and Edinburgh

TEACHING NUMBER TO CEREBRAL PALSIED CHILDREN

The teaching of number to cerebral palsied children is fraught with more difficulties than the teaching of reading, and hence progress in this subject is likely to be much slower. All the disadvantages attaching to the handicaps discussed in the previous section on reading also apply to teaching arithmetic, except for speech defects, which seldom occur alone in cerebral palsied children. But to these difficulties is added the inco-ordination of the hands, which is a serious consideration in the teaching of number. A hand defect does not affect the pupil's ability to do arithmetic if his dominant hand is unaffected, but even a slight disability of the dominant hand holds up the child in his progress in arithmetic. More serious hand inco-ordination, which prevents a child from using a pencil, limits his scope in this field, for written practice is of paramount importance in learning arithmetic in the more advanced stages.

Even with severe hand disabilities, however, some progress can be made in arithmetic if ingenuity is used in the construction of learning apparatus.

The early lessons in number with these children followed the usual modern practice based on practical work and the use of the concrete until an understanding of number values was attained. More than the usual amount of time was spent on such pre-number preparation as noticing the size and shape of things, paper-folding, copying and cutting out or matching different geometrical shapes, and so on, for it was found that most of these children had an undeveloped sense of spatial relations—a very common characteristic of cerebral palsied children and one noted in many of the children tested during the survey.

In the first stages of learning number the pieces of apparatus were painted to help the child in his problem. For example, where the child had to put cards bearing the numbers 1, 2, 3, etc. into the correct boxes he was guided as well by the similarity in colour between each number and the corresponding box. For it was found that all the children had a good response to colour, whatever their level of intelligence or their special disabilities. This fact has also been noted by Strauss and Lehtinen, who write: 'We have found that color perception and responsiveness to color remain intact in spite of the severest disturbance of perceptual or general integration.'[1]

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[1] For further guidance on this problem see *The Psychology and Teaching of Reading* (F. J. Schonell, Oliver and Boyd, 1944), pages 90 and 91, in which lists of books are given and special books for the older backward reader are also considered.

Similar devices were invented to assist children to overcome any special physical or psychological difficulties they had. For example, a child who counted more quickly than his hands moved the counters and so did not realise the meaning of the counting was given large beads to thread on a string, together with cardboard discs bearing a number. Thus he would be required to thread one bead then a disc marked 1, one more bead and a disc, etc. When he had practised this for some time he could pass on to two beads with the corresponding disc, and so on, thus:

oo 2/ oo 2/ oo 2/ ooo 3/ ooo 3/

The children's tables were fitted with elevated edges to prevent apparatus and books from being knocked off by the frequent involuntary or spastic movements of the pupils, and those who experienced difficulty with the ordinary type of counters had peg boards and rings for practising number work. These peg boards not only helped the child to keep his attention on the work in hand but also gave him an accuracy check. If all the pegs were not covered he knew he had made a mistake.

As a considerable amount of individual apparatus was being used it was found helpful to make it of this self-corrective nature. Such things as jigsaws, colours and pictures were used as checks on accuracy in number matching or, later on, for simple sums on the four rules. This use of individual work also had the advantage of encouraging independence on the part of the children and of allowing each child to progress at his own rate.

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[1] Alfred A. Strauss and Laura E. Lehtinen, *Psychopathology and Education of the Brain-injured Child*, Grune and Stratton, New York, 1947, p. 136

Children who experienced difficulty in handling a pencil were given numbered blocks with which to show the answers to sums. Plate 8 (facing page 169) shows a girl using this apparatus for doing simple addition sums. Another aid with such children is the magnetised board with numbered blocks.

With such a variety of handicaps as Class 1 presented, an individual approach in number work was essential. This meant that while those who could use their hands were doing assignments with apparatus the teacher took blackboard work with Jill and Jack, who could not use their hands.

Jill used her eyes to follow while the teacher counted and then she said the answer, which the teacher wrote on the blackboard or in her book. Jack, who could not see the numbers but who could talk, listened while the blocks were moved on the table and then gave the answer.

It will be realised that for these two children the amount of number work they could do was limited, but with Jill, for whom prognosis was good, this understanding of number values would be invaluable at a later stage when it was expected she would be sufficiently improved physically to use her hands for writing. For Jack the prognosis was not at all promising. The remainder of the class made varying amounts of progress, dependent largely on their level of intelligence. All except Sam had some concept of the meaning of numbers and could do some number work, while the three most advanced children were learning the composition of numbers to twenty, using sticks in bundles of ten.

Arithmetic with Older Children

At the beginning of the year all pupils in Class 2 were given the Diagnostic Arithmetic Tests[1] to determine the individual difficulties of the children and the level of their attainments. The results of these tests revealed that the arithmetical attainments of all the children were below those expected, and remedial work was begun, using arithmetic practice cards for learning and testing number combinations.[1]

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[1] *Diagnostic Arithmetic Tests*, by F. J. Schonell, Oliver and Boyd, Edinburgh

Once again an individual approach was necessary. Mary, who was making no progress, was transferred to Class 1, where concrete materials were still being used. Katherine, whose unique sight defect necessitated individual teaching, was taken alone with specially constructed large number apparatus and for the first time, at the age of eleven, she began to have an understanding of the real significance of numbers.

The remainder of the class worked individually from graded arithmetic books, with varying degrees of success. The fact that all except two of these children had some degree of hand disability limited their progress. Brian was not allowed to use his hands for the first few months, but when he was permitted to do so he became very keen to improve his arithmetic attainments. Betty's progress was so satisfactory that when she left to go to an ordinary school at the end of the year she went into her normal age group and maintained a place in the top section of the class.

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[1] For this purpose teachers used the *Graded Arithmetic Practice Cards* and *Practice in Basic Arithmetic*, Books 1, 2 and 3, by F. J. Schonell, Oliver and Boyd, Edinburgh.

PART FOUR :

PSYCHOLOGICAL AND SOCIAL ASPECTS

CHAPTER XVII

THE PSYCHOLOGY OF THE CEREBRAL PALSIED CHILD

IS THE CEREBRAL PALSIED CHILD UNSTABLE?

RESULTS from discussions of incidence of instability amongst cerebral palsied children may lead to a wrong bias in dealing with these children. It is probably true that a higher percentage of cerebral palsied children exhibit some form of instability than do physically normal children, but if we examine the facts more carefully we find that the picture is not so discouraging as has sometimes been indicated.

In assessing the problem accurately we need to consider four factors. Firstly, we should not be confused by comparing groups which are unlike in other essentials besides the one distinguishing the groups. Undoubtedly cerebral palsied children with markedly inferior intelligence may be frequently unstable in the emotional sphere, but this is also true of non-cerebral palsied groups of low intelligence. Secondly, if we take cerebral palsied children who have rarely had normal child contacts and opportunities in a suitable school, we should compare these with unhandicapped children in similar circumstances. Might not physically normal children become unstable if shut off from normal experiences? Therefore, if we must compare groups, let us consider cerebral palsied children who attend satisfactory schools. Thirdly, when we do study intelligent cerebral palsied children attending modern schools with special facilities, we find that pronounced instability is rare, particularly among the very young and among those who have attended school for a prolonged period.

Fourthly, it is interesting to compare the types of instability which are most common in the cerebral palsied group with those found in normal groups of children. The cerebral palsied child's instability usually shows itself in one of the following: fear of falling, a feeling of insecurity, lack of confidence, a self-centred attitude, over-dependence, over-anxiety, loss of self-control (hysterical laughing or crying and aggressive temper outbursts). Instability in physically normal children may include amongst other manifestations some degree of the following: lying, stealing, cheating, vandalism, rudeness (speech or actions), cruelty, aggression, wilfulness, quarrelling. It will be noted that most of the types of instability characteristic of the cerebral palsied are derivatives of a central core composed of the child's handicap and the early attitude of others towards him. We found at Carlson House and in the Queensland Spastic School that careful handling of this problem can go far towards modifying the emotional reactions of the children. Few of the forms of instability in normal children set out above are found among cerebral palsied children—possibly on account of the nature of the life they lead.

Thus it will be observed that the cerebral palsied child's instability is usually non-aggressive in nature and he himself is its chief victim. Moreover, we believe that where children are brought at a very early age for treatment and social training in a happy but disciplined atmosphere many of them will grow up with a minimum of weakness in this respect.

PERSONALITY AND SOCIAL DEVELOPMENT

Gesell says: 'In general, temperamental characteristics are usually the least affected by cerebral injury. The child has an underlying individuality which makes itself manifest.'[1]

Gesell here uses the phrase 'temperamental characteristics' to mean dispositional characteristics or affective aspects of personality that are largely of an inborn kind, and his pronouncement is in agreement with results from this research. Studies of the pupils in Carlson House have not revealed any innate limitations on the temperamental side—there were no children with a personality pattern of a stunted, twisted, or permanently injured kind. All appeared capable of all ranges

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[1] Arnold Gesell and Catherine S. Amatruda, *Developmental Diagnosis, Normal and Abnormal Child Development*, p. 239

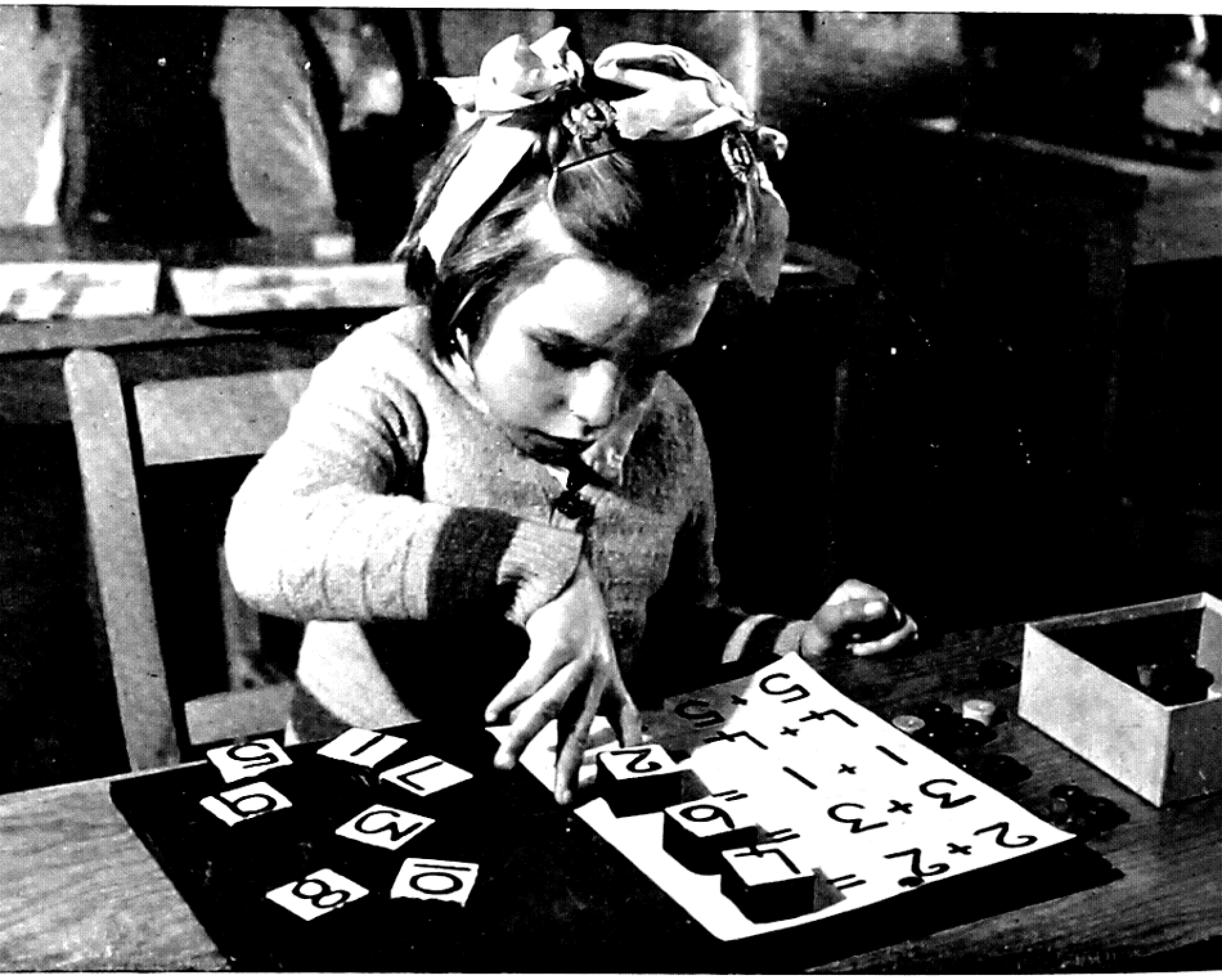

PLATE 8 Girl, unable to write, doing sums with blocks

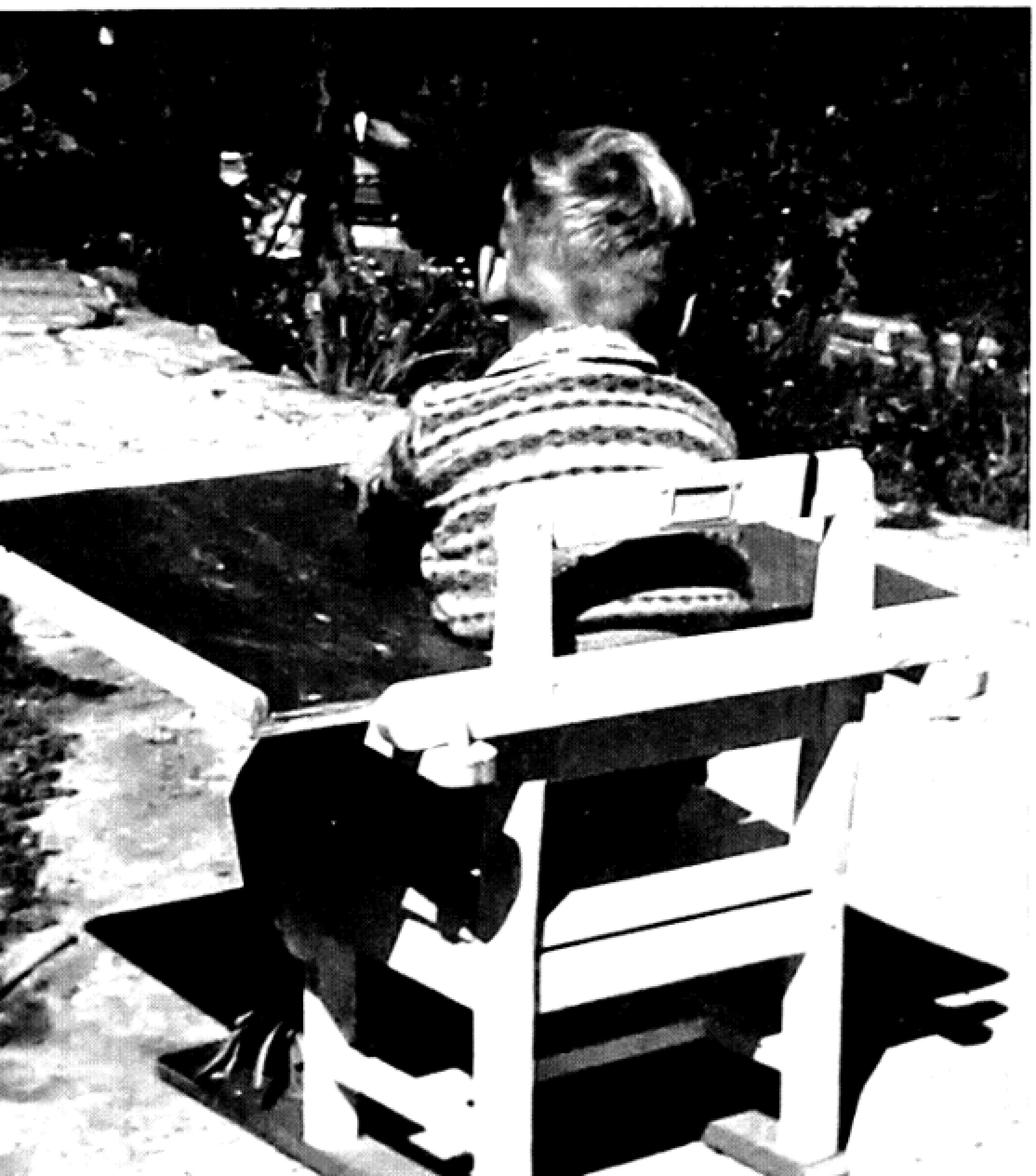

PLATE 9
Child using adapted chair
with tray attached

of normal affective responses, and there were none who revealed a disposition of a pathological kind deriving from temperamental limitations. In other words, there were none for whom cerebral palsied conditions had produced marked instability or temperamental defect, such as are described by Burt when he writes: 'The instincts and emotions are developed to an excessive degree, and the child's behaviour and intellectual processes are as a result unbalanced.'[1]

While the Carlson House children did not appear to suffer any temperamental defect as a result of their physical handicap, there was ample evidence to show that there were two spheres of weakness or maldevelopment in personality. Firstly, there was with all of them a certain emotional unbalance due to their physical conditions, but this was an emotional condition which could be righted. Secondly, they were socially deprived children for whom there was the need to introduce much planned experience of both a social and a therapeutic kind if they were to 'catch up' with personal and social development. It was on the acquired side of personality, namely development of social attitudes, assimilation of social knowledge and strengthening of personality traits, that there was need for help.

(a) *Use of the Vineland Social Maturity Scale*

Attempts were made to assess social development of two kinds, namely social development involving physical activities and social development dependent mainly on mental attitudes. For this purpose information was derived from two sources: (*a*) the use of the Vineland Social Maturity Scale[2] and (*b*) case studies of the children made continuously during their time at Carlson House.

The Vineland Scale was used although it has certain limitations for assessing total social development. It is strongly biased in the use of items involving physical maturation and co-ordination in relation to social situations. Thus an analysis of its material up to the twelve- to fifteen-year-old stage shows that, out of eighty-nine items in the scale, no less than seventy-three relate to physical maturity and only fourteen to social maturity of a mental kind.[1]

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[1] This is Burt's definition, taken from *The Backward Child*, University of London Press, p. 451. A similar definition is given by A. Maberley in The Personality of the Problem Child, Part II of a Symposium on Personality, *Brit. J. of Educ. Psy.*, February 1946.

[2] *The Vineland Social Maturity Scale: Revised Condensed Manual of Directions*. Publication of The Training School at Vineland, New Jersey, Department of Research, Series 1936, No. 3

Nevertheless the scale does reveal in an accentuated form the handicap of cerebral palsied children on the physical side compared with normal children, and, in so far as physical development is related to emotional and social maturation, the low scores of some of the children emphasise the extreme difficulty of the problem of their total education.

The results emphasise the way in which severe physical disability directly and cumulatively retards many aspects of locomotion and self-help, and to some extent also social maturity in other less obvious directions. Thus, severe cases such as Brian, Katherine and Brenda were unable to get about and do many of the things that quite young children can do—their whole socio-physical development was retarded as a result of the severity of their handicap. Yet this need not retard their social development of a mental kind, as was shown in the case of Brian, who was in many of his attitudes and in much of his social knowledge the superior of normal children of similar chronological age.

In addition to physical limitations that may handicap the social development of cerebral palsied children there is also the possibility of over-protection by the parents because of the child's physical disability. This may retard the child even further.[2]

(b) *A Case Study Approach*

'Developmental diagnosis inevitably makes use of standards of normal development, but in handicapped conditions the child must always be regarded as his own best norm.'[3]

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[1] The Scale should really include many more items involving social attitudes and social knowledge before it could be described as a social maturity scale.

[2] Kellmer Pringle draws attention to the possible effect the sheltering of children may have on their social development. See Social Maturity and Social Competence by M. L. Kellmer Pringle, *Educational Review*, Vol. 3, No. 2 and No. 3, 1951.

[3] Arnold Gesell, The Development of the Cerebral Palsied Child, extract

This does not mean that we should accept the handicapped child's limitations as fixed and unalterable but rather that we should let his progress be measured, not by competition with others, but by comparison with his own previous performances. In this way physical and mental development can go hand in hand with personality and social development.

As has been shown, the social and emotional maturity of handicapped children is often considerably below that expected from their mental level, and an important part of their school training consists of the enrichment of their experiences and training in these aspects which will be so important to them in later life.

From the beginning of the Carlson House project it was borne in mind that emotions can both disturb and promote learning, and so activities were planned in such a way that the effects of the children's limited experiences and the disturbed emotional states associated with their disabilities were gradually diminished, while efforts were made to encourage the development of desirable attitudes such as independence, self-confidence and co-operation.

As in other work with cerebral palsied children, the approach in this field needed to be an individual one. Each child, being a unique composite of physical, mental and emotional characteristics, required individual understanding and consideration. There were, however, some traits which were common to subgroups within the school and which were characteristic of certain types of cerebral palsied children.

The Spastic

The spastic was found to be fearful and timid; he disliked loud noises and was afraid of falling. This fear was probably due to his early experiences in trying to stand or to walk and was no doubt increased by his parents' anxiety; it proved a handicap to the child when his physical improvement enabled him to begin walking. Thus Peggy, who had had several bad

from *The Handicapped—A Great National Resource*, the reported proceedings of the 1947 Annual Convention of the National Society for Crippled Children and Adults Inc, Chicago falls (once cutting her head), was afraid to try walking with her sticks even after she had done it a number of times in her treatment sessions. To cure this Peggy was shown how to fall in such a way as not to hurt herself, and having done this constantly at treatment, she overcame her fear of walking in the garden.

In this connection it is unwise for parents or others to make too much fuss over a cerebral palsied child's first attempts at walking, for the tension produced lessens his chance of success. Rather is it better to treat the matter as normally as possible, showing neither excessive pleasure nor anxiety.

Children who feared to be left alone on the treatment table were gradually given confidence by being shown that they would not roll off.

The younger spastics also exhibited an undue fear of being left alone in a room for a few minutes and they would often cry if this happened. Brenda, who was a hydrocephalic, found it particularly difficult to overcome this tendency. This fear may have originated in the child's inability to move about if she wished to do so and was almost certainly associated with an over-dependent attitude.

Phelps and other workers in the field have described the spastics as fundamentally introverted and egocentric, but experience in the present research indicated that this was by no means a universal trait, although it may appear to be so if the spastics are compared with the athetoids, who tend to be extraverts. Many of the very severely handicapped spastics were self-absorbed and slow to make friends, but the majority of the slightly or moderately handicapped were normal in this respect. Of the twelve pure spastics in the Carlson House group, three were definite extraverts.

The Athetoid

The athetoid presents quite a different picture from that of the spastic. He has more confidence than the spastic, perhaps because, being able to move his limbs, he has not been so constantly frustrated as the spastic. He is friendly and affectionate and does not show self-consciousness about his handicap although it usually attracts the notice of strangers on account of the awkward involuntary movements and grimaces. The athetoid is a happy extravert but if aroused he is inclined to show quick anger and dislike. He is keen to co-operate but often fails through trying too hard, for when his emotions are aroused his involuntary movements increase and his eagerness to help defeats its own ends. Yet while he concentrates on something the involuntary movements cease. Brian would sit absorbed while listening to an explanation or description, but when he attempted to answer he began to make writhing movements and his words came in short explosive bursts. For this reason it was wise to keep his mind occupied with what was happening and to try to let him forget his muscles. Concentration on the purpose or end of the movement rather than on the movement itself appears to reduce unwonted jerkiness.

Social Training

Having studied the individual temperamental variations of the pupils in the experimental group, it was necessary to plan classroom activities to compensate for the deprivations that the pupils had suffered. Even in the good homes the environment was found to be impoverished in the sense that the children had not been given sufficient experiences that are vital for normal child development. Children who had never walked were quite happy to spend their time sitting in chairs; those who could not feed or dress themselves were content to allow others to do these tasks; some who had severe speech difficulties spoke as little as possible. In these cases parents had been encouraging their children to perpetuate these disabilities by doing as much for their personal comfort and entertainment as they could do. Little did they realise that they were reducing the child's chance of physical and mental progress.

At Carlson House the opposite approach was made. Pupils were treated as nearly as could be like normal children, and were encouraged to do as much as possible for themselves. Physiotherapy aimed at producing correct muscle movements while the occupational therapist gave training in self-feeding and dressing. Over-dependent children still allowed their parents to dress them, long after they were dressing themselves in school. Ernest and Peggy, both paraplegics whose hands were normal, were loath to forego this old habit. When their mothers were shown the children dressing themselves in school they were quite astonished. This mental attitude of taking the easiest way sometimes transferred to school work, and pupils ceased to try when the first difficulty presented itself.

On the other hand, where parents continually urge their child to try to do the impossible the child tends to lose confidence and to withdraw into himself. This was very noticeable with Kate, whose parents, in a well-meaning way, had tried their utmost to help her to walk. Her failure to walk like her twin sister caused her to give up trying to overcome other difficulties. At Carlson House she gradually began to find she could do the tasks that were set for her. She had been taken off her feet entirely. No one expected her to do anything she could not do, and so gradually she gained confidence in herself. She began to improve in her speech and the physiotherapist reported progress. She started to read, to understand number concepts, and to find pleasure in the free activities of the classroom. She is now walking again, more steadily and with a much better gait than previously.

Throughout the work done with this experimental group of children, the positive aspects of living and doing were emphasised. Children were happy and secure in an atmosphere of friendliness and co-operation where, as a rule, all members of the class enjoyed the success attained by each individual. In the first few months Edward and Oscar were bored and listless, not interested in lessons or co-operative in free activities. Then as the group's interest in weaving developed, and Betty made suggestions as to how they could make weaving frames, they began to enjoy the periods and finally became so engrossed in this occupation that their finished products were among the best of the group. A similar situation is described by Simpson and Alderson in their account of the use of creative play with children between the ages of four and eight; they found that 'through seeing and joining in the activities of the creative children the effortless ones will sometimes become interested in a certain material, and in this way they will start to experiment and make effort with that material.'[1]

The happy co-operation and freedom from friction that characterised the school routine were reflected in the friendly play of the children, and probably explains the almost total absence of selfishness, spite and quarrelsomeness which teachers of handicapped children often report as characteristic of crippled children.

Efforts were made to plan the children's experiences with the widest possible scope. Thus local people, like the postman and policewoman, were brought into the school to tell the children about their occupations. Visits were fairly frequent. For example, the pupils were taken to town to see the marionette show, which gave some impetus to their own efforts in this direction. When the Princess visited the city arrangements were made for the children to be in the street with other school children to see her being driven through the city streets. All the school went to the bluebell woods for a picnic which provided conversation and play material for a considerable time. Some of the older pupils who had done weaving were taken to a carpet factory, where they saw on a large scale the same principle of weaving as that of their own home-made looms.

In all these and many other ways the children at Carlson House were given the opportunity for personality and social development through expression of real experiences.

In free activity they were enabled to overcome aggression and to learn to control their emotions, to gain a sense of personal worth and the ability to attack new situations with increased confidence. Simpson and Alderson's experimental approach with normal pupils aptly describes what the experiment at Carlson House has shown; they say: 'We are convinced that the more the child is able to express himself creatively, the happier and more satisfying is his life. If his activities are spontaneous, if he can plan, invent, and use his imagination in his activities, working from his own inspiration, in his own way and in his own time, then he will put the whole of himself into whatever he is doing. He will live in the present, which will be both rich and satisfying to him.'[1]

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[1] Dorothy Simpson and Dorothy Alderson, *Creative Play in the Infants' School*, Pitman, 1950, p. 45

Principles of Mental Health

Intrinsically the cerebral palsied child is basically like any other child. He has a full range of instincts and emotions, which, beneath his superimposed handicap, develop and demand satisfaction as he grows older. Hence, in dealing with these children, whether as parent, therapist or teacher, it is vital for us to understand something of the psychological needs of normal children; we can then comprehend the child's reactions and help him to adjust to the various stresses and strains of living, complicated as they are for the handicapped child.

Love and Security

Probably the most important ingredients of a satisfactory emotional life are love and security. To a child they are indispensable. In my experience cerebral palsied children are seldom deprived of the former but often lack the latter. Without love a child cannot feel secure, but it is not sufficient to lavish affection indiscriminately on our child. Children do not like being regarded as possessions to be pampered and shown off to visitors; they develop most happily when they are encouraged to think and act for themselves as far as possible, so long as they know that they can obtain help and guidance when they feel the need for it.

Independence

By cultivating a spirit of independence coupled with co-operation we can best strengthen a sense of security in our children. This is particularly important in the case of the cerebral palsied child. Some parents, in their desire to compensate their child for his handicap, wait on him and load him with expensive toys which they even set in motion for him, thus completely sapping initiative and desire for independence from the one they most wish to help. Unless a child's hands

[1] Dorothy Simpson and Dorothy Alderson, *Creative Play in the Infants' School*, p. 101

PLATE 10 Girl using peg board

PLATE 11 Recording a child's speech

are completely disabled he should be encouraged to try to manipulate his own playthings, which should be mainly of an educative type.[1] The cerebral palsied child experiences difficulty in doing many of the things normally accomplished with little or no effort by his unhandicapped brother. Hence it is advisable to provide play materials within the limit of his powers but of sufficient scope to enable him to exercise his ingenuity as well as his muscles.

If play can be organised on a co-operative basis along these lines the child gradually builds up a sense of his own ability to do and to think for himself. If the motivation or interest is great enough he will persevere to overcome the discomfort associated with the use of handicapped limbs and the frustration caused by repeated failure. Successful accomplishment of a difficult task brings far more joy than does passive watching while a loving parent winds trains or sails boats.

Success, Self-confidence and Discipline

Success is probably the greatest single incentive to effort. Therefore we need to provide opportunities for all children to succeed at something, however simple. Success begets self-confidence, which in turn develops the energy for further effort. If, therefore, we can enable a handicapped child to succeed, perhaps even excel, in some direction, his entire personality is affected. We must, however, guard against the tendency to praise indiscriminately everything the cerebral palsied child does. We must constantly bear in mind that we wish to fit him to take his place in the world of adults and hence we need to train him to appraise his own efforts and to be satisfied only with the best of which he is capable. This self-discipline will prove of value to him when he reaches adolescence. He will learn to evaluate his efforts and control emotional outbursts when failure is imminent. Equally he will attain a certain degree of self-esteem or personal worth, which he could not do if parents allowed him to grow up in an atmosphere where his desires were immediately satisfied either by devoted parents or by his own use of temperamental outbursts to force

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[1] See lists of occupations given at the end of this chapter.

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[1] See lists of occupations given at the end of this chapter.

All discipline should be consistent. If a child is never sure whether his behaviour will evoke a laugh or a frown from his parent then he finds it difficult to formulate desirable reactions. Children should be encouraged to co-operate by the adoption of a firm but kindly attitude on the part of parents and others. Corporal punishment is never desirable, as, in addition to the usual arguments against this method of maintaining discipline, we must realise that the emotional reactions to corporal punishment would in most cases jeopardise any chances of successful action by a cerebral palsied child.

Companionship

Every parent knows how much children depend on the companionship of other children. For the cerebral palsied child, limited as he is in his capacity for physical attainments, this type of social contact is vital. Where he can attend school he gains the advantage of being accepted into a group as a fellow member and quickly learns to adapt his behaviour to the acknowledged pattern of the class. He sees other children, who are more handicapped than he, tackling problems. He is no longer the centre of a doting household but just 'another boy' who has to fit into the established routine instead of having the routine fitted around him. This gives him a correct sense of perspective in regard to his relation to the community.

When these attitudes are carried over to the home situation the child is given a chance of developing to the best advantage. He learns early to realise that he is a member of a group—not necessarily the most important member—and has responsibilities towards the others as they have towards him. The probability of his becoming self-centred and morose is reduced; he has experience in facing difficulties, and consequently side by side with growing independence goes a sense of security in place of the fear which characterises most young cerebral palsied children.

Fatigue

From the nature of his disability it is obvious that a cerebral palsied child will fatigue more easily than one who is not physically handicapped. Hence it is wise to ensure that activities, whether physical or mental, are not unduly prolonged. When fatigue begins to set in the exercise deteriorates rapidly and the wise course is to let the child rest and then change the occupation. Excessive excitement and noise are frequently sources of fatigue and should be avoided as much as possible. The greatest boon to a cerebral palsied child is the ability to relax when the possibility of increased tension threatens.

Concentration

Just as cerebral palsied children tend to fatigue easily, so they find it difficult to concentrate for long periods. Naturally there are individual variations in this respect but, generally speaking, they need shorter periods at one activity whether in or out of school. Moreover, they are more easily distracted than normal children and hence the desirability of reducing to a minimum incidental sensory stimuli, particularly when children are working at lessons or co-operating in treatment. In this connection it has been found beneficial to allow older, easily distractable children to study in separate cubicles made by the erection of small screens which fit into the wall of the room, thus shutting off from the child the general stimuli confronting the remainder of the class.

Handedness

Hand dominance is largely determined by heredity but early training plays an important rôle in establishing which hand is to be the stronger, particularly with those children who have a tendency to use either hand. Some parents are proud of the fact that their child uses both hands equally well; actually, when neither hand appears to be dominant performance is generally of a lower standard than where one hand is stronger. For this reason it is advisable to determine which is the dominant hand and thereafter to encourage the use of this hand for activities requiring one hand only. When a child appears to be ambidexterous it is wise to encourage him to develop the right hand, for in a 'right-handed' world the discomforts and difficulties that beset the left-hander do not worry the right-hander.

The cerebral palsied child whose naturally dominant hand is handicapped presents an additional problem. If the disability is slight and the child is young every effort should be made to encourage the use of the dominant hand, but where the damage is so severe that successful use of the hand seems unlikely the best course is for the other hand to be used for such things as writing, throwing, etc. while treatment is continued with the affected limb.

It is sometimes suggested that a transfer in hand dominance is likely to produce stammering. In such cases it is probably not the transfer but the method of accomplishing it that causes the stammering. If compulsion of any kind, whether physical or psychological, is used the child becomes tense and confused and hence uncertain of himself. This loss of self-confidence is likely to affect him generally, and if at the same time he is learning to talk or to read, stammering may occur.

In order to complete a transference of handedness successfully it is important to gain the co-operation of the child, if he is old enough to understand. If he is very young, habits have not yet become established and the task is easier. When both hands are normal it is helpful to let the secondary hand do some minor job such as holding a duster or paint pot while the child draws on the board or paints. On no account should a child be punished for failing to use the selected hand, for emotional tension defeats the ends for which we are striving. Neither should undue attention be paid to the matter, for occasionally a child persists in using the left hand merely because he feels superior to his ordinary classmates who use the right hand.

Games, Occupations, Interests and Hobbies

Like other children the cerebral palsied need a wide variety of indoor and outdoor experiences and the opportunity to follow occupations and develop interests and hobbies if they are to make the most of their potentialities, physical and mental.

It is apparent that all children will not be capable, or desirous, of taking part in all occupations; moreover, standards of accomplishment will vary greatly. But these considerations do not affect the prime purpose, which is fourfold. Firstly, these occupations prevent boredom, which if prolonged is likely to produce discontent and unhappiness; secondly, if pastimes are selected carefully they may be partially effective in improving muscle tone or educational ability in some direction; thirdly, an interest or hobby may develop a proficiency which later proves valuable as a means of livelihood and/or a leisure pursuit. And, perhaps most important of all, handicapped children find emotional satisfaction in the fun and games of their brothers and sisters.

Below is given a suggested list from which the discerning parent or teacher can choose items suitable for his child or children. Notes are added where necessary and materials required are mostly of a simple and inexpensive nature.

Games

Mothers and fathers
Hospitals
Shops
Engine or car drivers
Hide and seek (sedentary)
I spy
Twenty questions
Peggoty
Draughts
Dominoes
Chess
Quoits
Deck billiards
Bull board
Swings
Seesaws
Circus
Merry-go-round
Tricycle riding

Occupations

Making wool animals
Sand and water play (home or seaside)
Making worlds (blocks and miniature figures)
Cooking
Bead threading
Painting
Peg board play
Raffia work
Weaving
Papier mâché work
Modelling (clay or plasticene)

Interests and Hobbies

Pets
Gardening
Pottery
Weaving
Basketwork
Sewing (dressmaking millinery, flower-making, etc.)
Embroidery
Knitting
Cooking
Carpentry
Wood carving
Metal work
Leather work
Reading
Literature
Art
Music and singing
Puppetry
Photography
Collecting
Writing (authorship)
Pen friendships
Radio
Television

Games

Many of the games, occupations and hobbies listed above can be adapted for children who cannot walk about. For example, *Mothers and fathers*, *Hospitals*, *Shops*, *Engine and car drivers*, though primarily games for mobile children, can prove engrossing to youngsters who cannot walk, so long as a second person co-operates. Even *Hide and seek* can be played, by one player thinking of a hiding place and the other guessing where it is. *Tricycle riding* can be both enjoyable and of treatment value if care is taken to secure the pedal straps so that the feet do not slip about.

Occupations

Occupations, as distinct from games, have the added advantage of instilling in the child a sense of satisfaction and pride in achievement as well as developing muscles which need exercise. *Sand and water play* has a universal appeal and, although much can be done with the facilities available in a garden sand pit and old tub, with tins or jars for pouring, children should also be taken to the seaside occasionally and allowed to sit at the water's edge if they cannot actually swim or bathe.

Most of the occupations listed above are excellent for wrist, hand and finger development. Furthermore, they give training in the discernment of texture, colour, size, measure, capacity, etc., and help to develop judgment.

Making worlds is an absorbing pastime and allows a child to play out problems he finds it difficult to discuss. All sorts of bits and pieces can be used in this game, but it is worth while to provide the child with wooden blocks of various shapes and sizes, a small toy house, miniature figures, animals, trees, fences, ships, cars, etc. With such a selection the child's imagination can have full scope. Moreover, he can also be encouraged to build up scenes he has visited, perhaps using plasticene for making part of the model. For example, he might construct the harbour, with pieces of glass for the sea (or alternatively a blue sea painted on the piece of wood or paper on which the model is being built). Wharves, lighthouses, ships, cargo, people, can all be added. An old tin or wooden tray is a useful adjunct to any household for such occasions.

Cooking is enjoyed by small children of both sexes and the kneading of dough is excellent finger exercise, while the rolling helps wrist movements. With a little guidance even very young children can make a man with currants for the eyes, nose, mouth and ears and buttons down the coat, and this never fails to please, especially if mother actually bakes the product.

Threading can vary from putting coloured cotton reels on thick string to threading wooden or ordinary small beads on strong cotton. Another interesting variation is to break macaroni into various lengths, which are then dipped into different vegetable dyes; this makes attractive necklaces.

Finger painting. For finger painting take a large sheet of paper, white or brown if available, but even newspaper will do, and some jars of mixed water paints; the paper can be laid flat on the table or pinned to a sloping board or easel. The child then dips his fingers in the paint and, using large arm movements, makes patterns on the paper. The different colours and patterns merge into one another and produce some effective results; definite, neat patterns are not the aim of this form of painting.

Peg boards of infinite variety can be constructed and all have occupational and educational value. The peg board consists of a flat piece of board, approximately twelve to sixteen inches square, with a number of pencil-like wooden pins standing up at intervals on it, either glued on or let into the board. On these pins the child places small pieces of wood cut into geometric designs, or cotton reels, number tags, etc. Colours introduced into the scheme make the game more attractive and help to train the colour sense. Plate 10 (facing page 176) shows a peg board in use.

Interests and Hobbies

Most children can at some stage enjoy a number of the games and occupations discussed in this section. When we speak about an interest or hobby, however, we imply more than just a passing enjoyment: we imply the development of an occupation in a full and absorbing way to the point where it becomes a vital part of our lives. Some people have a wide variety of interests which they follow in a rather superficial manner, but after adolescence most people settle down to one or two hobbies which they approach in a more serious vein, almost in the spirit of the student.

If we let our young children have experience of various types of occupations they will then be able to decide for themselves which ones attract them on the hobby level. Their choice will be influenced to some extent by physique, intellect, temperament and early opportunities and may indeed be spread over a group of related interests. For example, a girl might be interested in dressmaking, millinery, embroidery and knitting, or again in weaving, basket work, leather work and pottery. A boy might develop an interest in the arts—music, singing, art and literature, dramatics and puppetry—or on the other hand in the sciences, including photography, natural history, radio and television.

Pets. Almost all children like to keep a pet, and although it usually means more work for the parents this interest is a good and instructive one. There is no better way of giving sex instruction than by having a female cat or dog about the house, but even if the pet is only a canary, a tortoise or a white mouse the resulting training can be advantageous so long as the child assumes responsibility for the pet.

Gardening. Our attitude towards gardening seems to be largely biased by our environment during early childhood. As cerebral palsied children are likely to spend a large proportion of their time in the home and garden, the wise parent will set out to encourage an interest in nature. If the child can get out of doors frequently so much the better, but if not, he can follow the growth of plants, etc., indoors. A large box on wheels (with rubber tyres) can be ideal for growing a few seeds or small plants. It needs to be at a height convenient for the child to reach it from his chair or bed, and may have an extra shelf beneath to carry odds and ends useful in the gardening operation—small sticks, string, miniature figures, bits of glass and perhaps a small tin or watering can.

Table for materials. Anyone confined to a chair or bed feels the necessity of a small table or cupboard for keeping objects he requires frequently. This not only saves the parent's time and patience but also gives the patient a feeling of independence and encourages him to do things. If a child has a cupboard for his belongings, then a bed table will be useful for arranging the things he wants to use, for writing etc. A useful form of bed table is a flat tray which has raised beading round the edge and stands on two sets of legs which fold under when not in use. An alternative to this is a table on wheels, with perhaps a second shelf underneath, rather like an afternoon tea trolley. On this can be left the child's paints, brushes, pencils, books, eraser, toy animals, jigsaw puzzles, trains, dolls, or anything in which he is for the time interested.

Reading. For cerebral palsied children reading can open the door to many interests otherwise out of reach, and so it is of the utmost importance to give these children every opportunity of reading if they are capable of so doing. But sometimes parents seem to have no idea of how to encourage their children to read. They give the boy of ten an abridged edition of a novel by Dickens and wonder why he doesn't like reading. *It is a good plan to select children's books very carefully, asking yourself the following questions*:

(1) Is the print of a clear, bold type and large enough for the child to read comfortably without strain?

(2) Are the illustrations bright, attractive and full of action?

(3) Is the vocabulary easy enough to enable him to read without much hesitation? Otherwise he cannot really follow the meaning and certainly will not read for pleasure.

(4) Is the story suited to his age and interests? It is better for him to read six books he enjoys than one 'good book' you force him to read. In the early stages short books are often best as they do not demand sustained interest for long periods and the children have the satisfaction of finishing a number of books.

Collecting. Perhaps the most fascinating and universal hobby of all is collecting; the objects which may be collected are innumerable and may vary from the shells gathered on the sea shore to the antiques and jewels of the connoisseur. Each type of collection has its merits, which lie not only in the pleasure derived from the collecting and later contemplation of the treasures, but also in the knowledge which grows up round such a hobby.

If a child evinces interest in a certain direction it is worth while showing him the proper way to make his collection. For example, the young stamp collector can be shown how to remove used stamps from envelopes and how to handle them with tweezers, etc. A simple book will explain the most important details associated with this hobby. Similarly, the nature lover should be encouraged to preserve the specimens he gathers, or has gathered for him if he is unable to walk. The butterfly collector needs a simple killing jar (glass jar with tightly fitted lid under which is a cotton wool pad soaked in ammonia) and a setting board made from a piece of board about 4 inches wide and 18 inches long with a half-inch groove down the centre to take the body of the butterfly. When the butterfly is dead it is fastened to the setting board by a pin through the head, the wings being extended to dry. However, perhaps the most important equipment for any collector is the specimen box for mounting or arranging objects collected. An inexpensive way of providing this is to get a large, fairly shallow cardboard box and make a cover out of cellophane, mitred at the corners. Alternatively a wooden box covered with glass can be used. A thin layer of cork in the bottom of the box facilitates the pinning of specimens, or cotton wool may be substituted where the specimens are shells, leaves, etc.

Cerebral palsied children who cannot collect their own specimens find a greater interest in their collection if they are occasionally taken out to see their parents or brothers catching the insects or gathering the flowers or shells. They can then visualise the setting for the descriptions of natural history when they read articles in books or look up references in a children's encyclopaedia.

The cerebral palsied adult has a very great need for an absorbing interest on which to expend his long leisure hours. Hence it is of the utmost importance that he be given every encouragement and assistance in developing latent interests in childhood and adolescence, for by so doing we can go far towards engendering a satisfactory and satisfying philosophy of life which may well sustain the adult in his attempts to justify his existence.

Note.—As these pages are passing through the press I have received a report of an excellent study made in Liverpool, *A Psychological Study of a City's Cerebral Palsied Children* by Ella B. Floyer (British Council for the Welfare of Spastics, 1955). Mrs Floyer's comments on the use of the Terman Merrill Scale, together with results from its use, provide interesting supplementary evidence on various aspects of the Birmingham research.

CHAPTER XVIII

HABIT FORMATION

HABITS

HABITS form imperceptibly through the constant repetition of certain actions, and hence it is important that the very young cerebral palsied child should be helped to perform correct movements as far as possible, to avoid the formation of bad habits which are likely to produce physical deformities over and above any inevitable disablement due to his palsy. For this reason certain surgical equipment may be prescribed by the doctor for day and/or night use. But in addition to this there are various types of adapted furniture and apparatus which will be found useful for cerebral palsied children in home or school. Some of these are mentioned below, together with a few notes which may help parents in the everyday task of caring for their disabled children. Infinite patience is a vital characteristic of all who would work with these children. *One must continually remember that co-operation, not censure, is the only basis for success.*

Breathing

Many cerebral palsied children have faulty breathing habits which militate against successful speech and swallowing; hence the importance of regular breathing exercises under the expert guidance of a therapist. Transparent drinking straws are useful for blowing and sucking as the child can see the effects of controlling the breath in various ways.

Drooling

If a child drools, or dribbles, we should not scold or look displeased but concentrate our efforts on showing him how to swallow so that the saliva will follow the natural channel. Let the child watch you swallow while he feels the movement of your throat muscles with his fingers, teach correct breathing and tongue movements and finally give small amounts of food from a spoon.

Feeding

Correct breathing, tongue movements and swallowing are necessary to ensure success in the feeding operation. Once these have become established the main problem is to enable the child to feed himself. A very severely handicapped child may remain dependent on others for this service all his life, but many can be helped to independence by supplying them with adapted tables, crockery and feeding implements. When a child's jerky movements threaten to upset plates and cups it is helpful to use a table or tray with a raised beading round the edge and depressions inset to hold the plate and cup, rather like the trays used for serving meals on air liners. (See Diagram 1.)

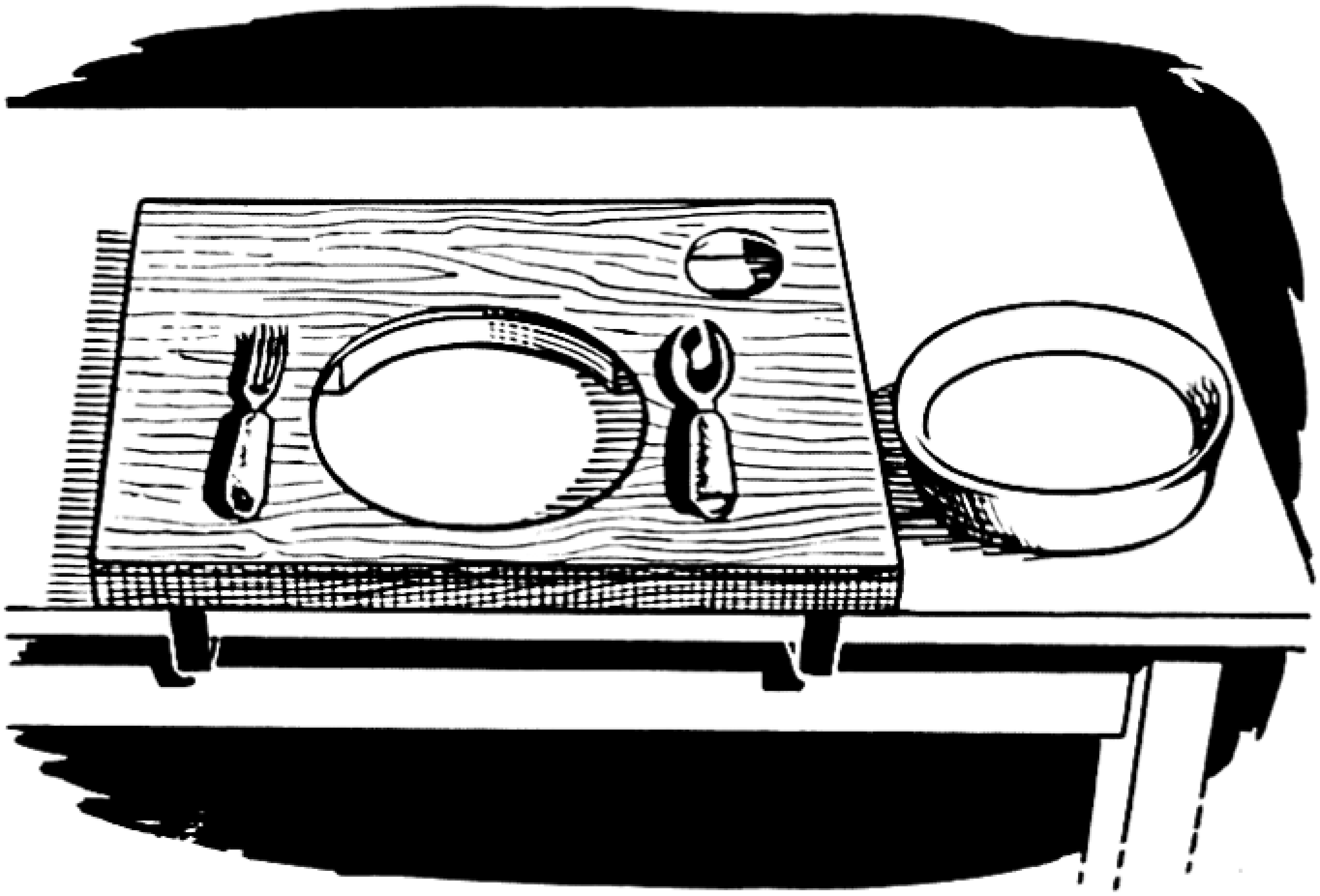

Diagram 1 Feeding tray

A deep plate with straight edges is better than the ordinary shallow type. As many of these children find it difficult to manipulate an ordinary knife, fork or spoon it is advisable to build up the handle to a size more easily grasped by the disabled hand. This may be done in several ways but the simplest and most effective is probably to use papier mâché and then lacquer it to make it washable. When a child finds it impossible to use the straight handle, then it should be bent to suit his particular grasp. In this matter each child should be studied individually and his implements kept for him alone. Similar attention should be given to cup handles and children should be encouraged to use both hands to ensure steadiness if necessary.

Speech

A high percentage of cerebral palsied children have some degree of speech difficulty which requires investigation and treatment by the speech therapist. There is, however, an important aspect of this difficulty which is often overlooked and which, if given careful attention, can improve early speech. It is obvious that a child who finds the mechanics of speech difficult will avoid making the necessary effort if he can have his desires satisfied without going through the tiring and unpleasant task of speaking. If a child is able to say a few single words then the parent can help him to increase his vocabulary by encouraging him to name certain objects he wants rather than anticipating his every wish or merely allowing him to indicate the object by pointing or looking at it. This method is time-absorbing but pays dividends in that the child eventually realises, by his success with certain words, that he can speak, and this success engenders further effort.

Sitting

In the past many cerebral palsied children who could not sit alone were left to lie on their backs indefinitely. These children had as their main field of vision the ceiling and an arc circumscribed about their beds. It is little wonder that many of them were considered to be low grade mental defectives, for how could their native intelligence develop under such limited stimuli? Today, however, every effort is made to enable children to sit up at or about the normal time, if only for short periods at first; each child needs special medical consideration and the specialist's advice on use of braces etc. should be strictly followed. If a child can sit up but is apt to slump over to one side a linen harness may be used, rather like those used for guiding toddlers, the extended belt being tied round the chair back.

Cerebral palsied children should not be allowed to sit on their feet but should sit on the floor with legs crossed in front of them, tailor fashion.

Chairs

As relaxation is a fundamental in work with cerebral palsied children it is essential for the child to have a comfortable chair, whether at home or at school. This does not mean that it should be padded or cumbersome. A suitable chair is one rather like those used in ordinary nursery schools or kindergartens but adapted to meet the individual requirements of the child. For example, if the child's legs tend to cross, a peg should be inserted in the middle front of the seat to prevent the legs crossing. The back of the chair may be straight or slightly curved, but may need to be extended upwards for a child whose posture requires added support for the back.

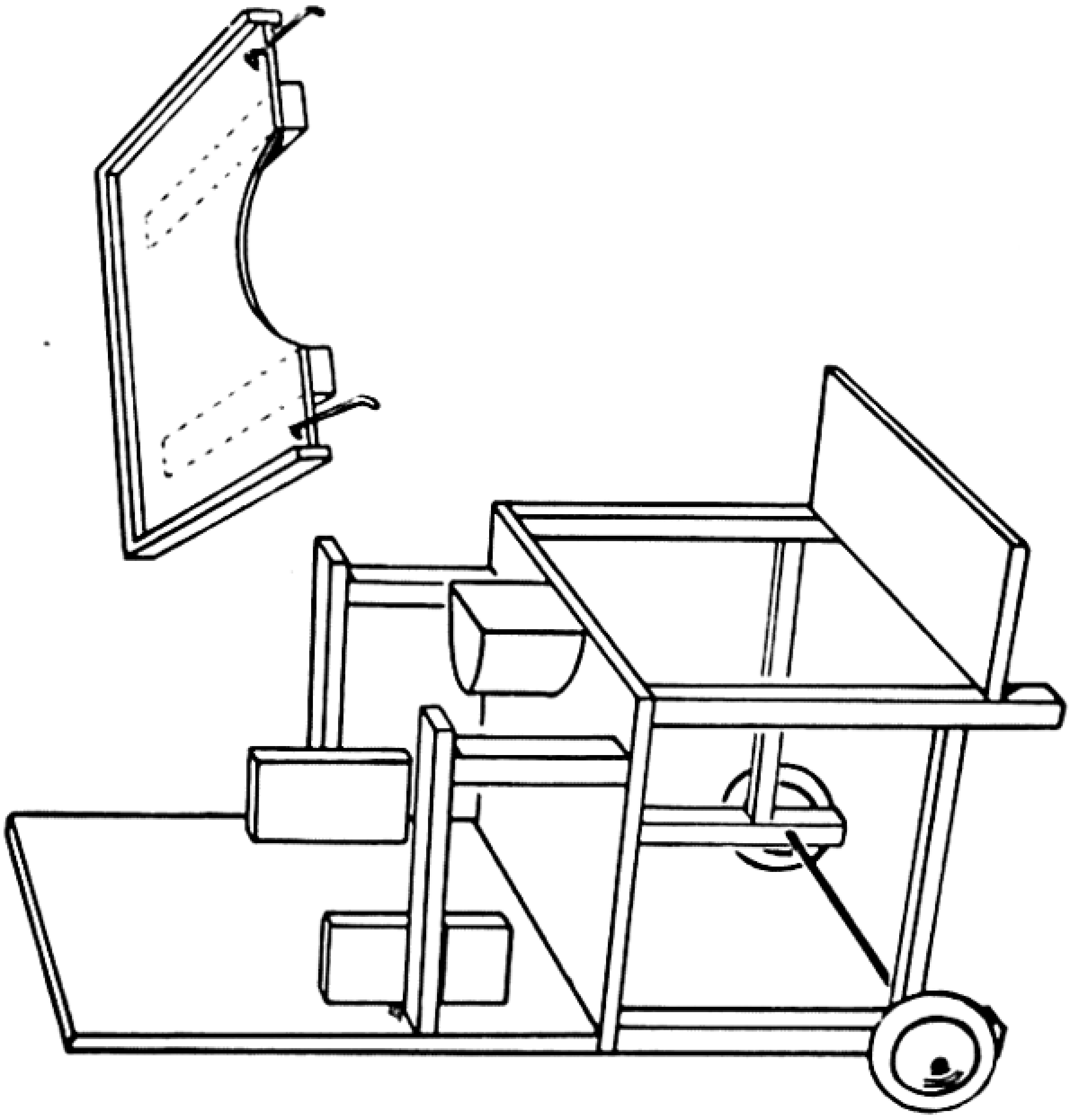

Diagram 2 Adapted chair for cerebral palsied child. See also Plate 9

If a child's head is likely to wobble sideways an extended head piece may be necessary and this can be slightly padded to prevent bruising if the head strikes it. Some children need armrests to their chairs and many require an adjustable foot-rest so placed that the line of the foot with the leg makes an angle of ninety degrees.

It is advisable to make tables and chairs with legs which are adjustable as regards height so that they can be altered without further expense as the child grows. A useful accessory is a satchel or flattish bag, made of some washable material, which can be hung on the back of the chair where the child can keep small books or articles he may require. For children who cannot walk it will be found useful to put rubber-tyred wheels on the back legs of the chair to facilitate movement.

Tables or Desks

Individual tables or desks may be used for cerebral palsied children so long as they are adapted to the special requirements of the individual children. For younger children the nursery school type of table is suitable and is light and easily moved.

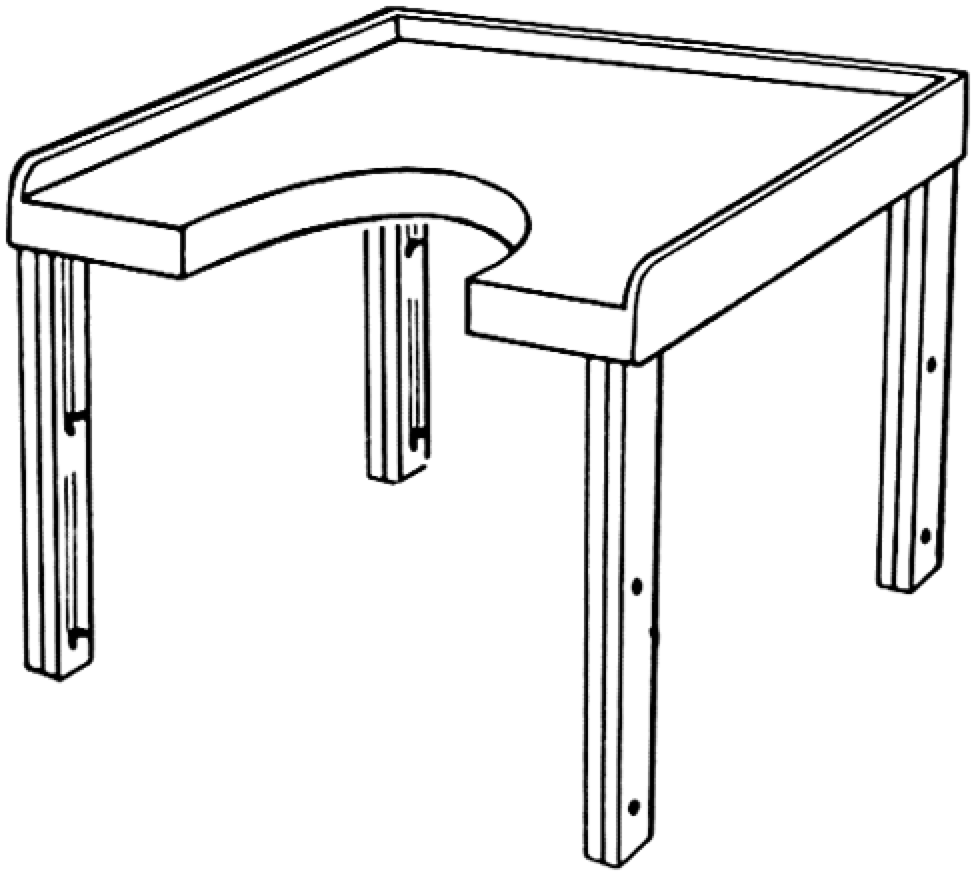

DIAGRAM 3 Adjustable cut-out table

For the older child, however, a desk with a space for books is an advantage. In either case a rim around the edge is usually necessary to prevent objects being brushed off. Some children need a rest for the arms and this is provided by cutting a semicircular piece from the table top so that the child sits forward in the space so formed.

Toilet

Although many cerebral palsied children are able to use the ordinary washing and toilet facilities, the more badly handicapped need special adaptations of the usual fixtures. Long straight tap handles are more easily managed by handicapped hands and the child is thus independent of others for running water. Toilet arrangements may be complicated for parents of severely disabled children. It is essential for children to be relaxed whilst on the lavatory, and so it is advisable to adopt one of two alternatives: a toilet chair with a hole in the seat can be constructed, or a special seat with the necessary supports can be made to put over the lavatory pedestal.

Standing

Standing practice is very necessary to strengthen muscles in the correct positions preparatory to walking. For this purpose a child wearing leg braces can be put in a standing table to do his work or to play. An individual standing table is one with part of the surface cut away to allow the child to stand erect when a little door is closed behind him, thus preventing him from falling. A large table may have several of these cut-out sections round the edge, thus allowing several children to use the one central table. (See diagram 4 overleaf.)

Walking

Various types of apparatus are used in the physiotherapy room for teaching children to walk but parents and teachers also find certain equipment useful. A round handrail at a convenient height along passages or round a large room is of great assistance to the child who walks with difficulty. Parallel bars and individual walking frames are also helpful, while a climbing frame, see-saw, swing, etc., are an advantage for any group of cerebral palsied children.

Where rooms are on different levels or where the garden is below floor level a ramp is advantageous, whether the child is walking or being pushed in a chair.

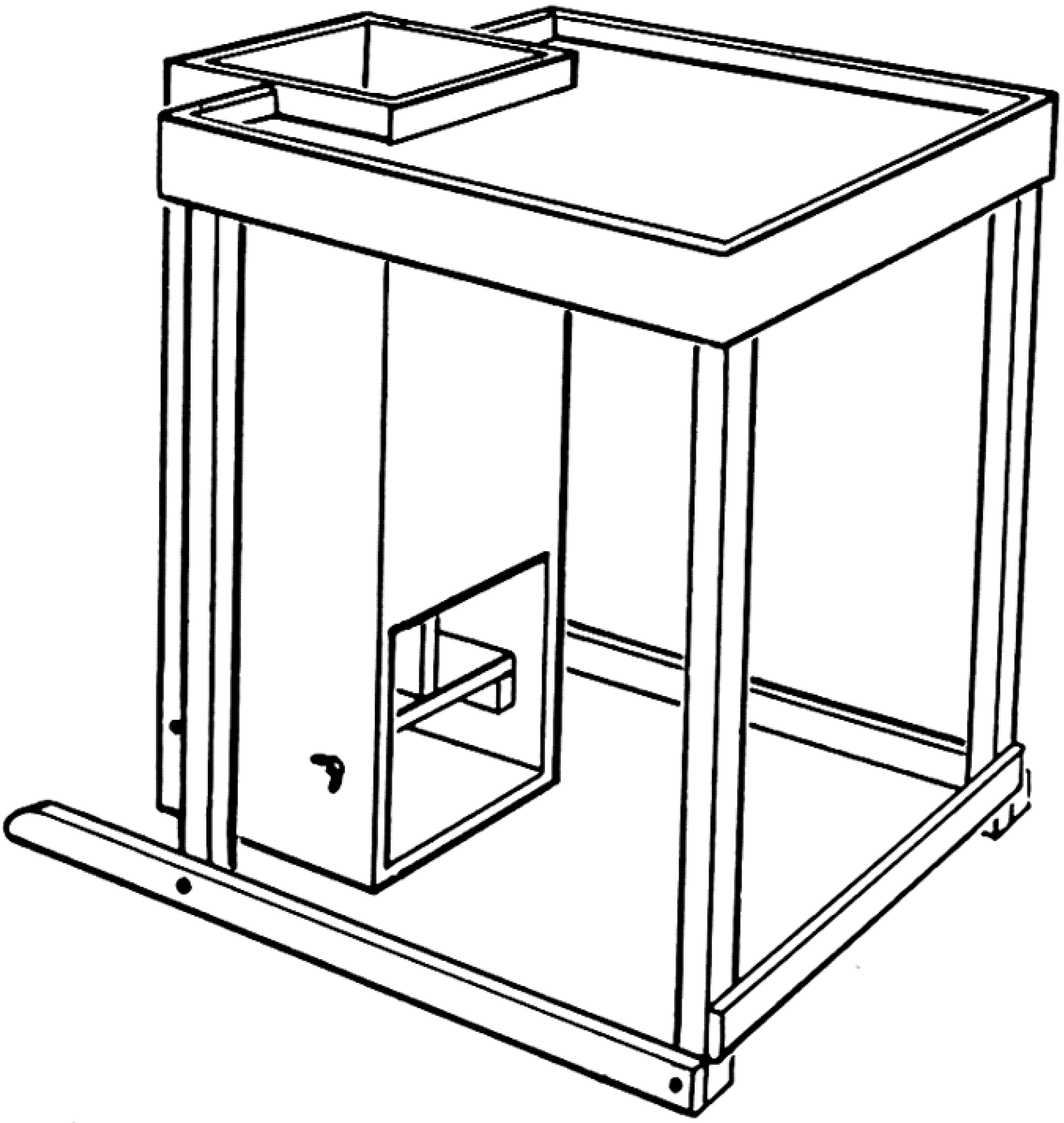

Diagram 4 Individual stand-in table. In this illustration a section has been cut out of the front panel of the standing frame to show the nature of the foot-rest inside. The back panel is hinged and opens to admit the child.

Dressing

Children whose hand co-ordination is poor need special physiotherapy followed by application of the same principles in everyday activities. In special centres for cerebral palsied children this may be supervised by the occupational therapist, but much can also be done at home by the intelligent parent. One of the most important things the child needs to be able to do with his hands is to dress himself, but this still needs some practice, which can be adequately given at home. When the child has practised putting his clothes on and off he will be faced with the still more complex tasks of buttoning coats and lacing shoes. These are more quickly learned if special large specimens are used, similar to the types recommended by

Madame Montessori. Buttoning is taught using large buttons and buttonholes on calico strips, while a similar arrangement of large holes and stout cord is used for teaching lacing.

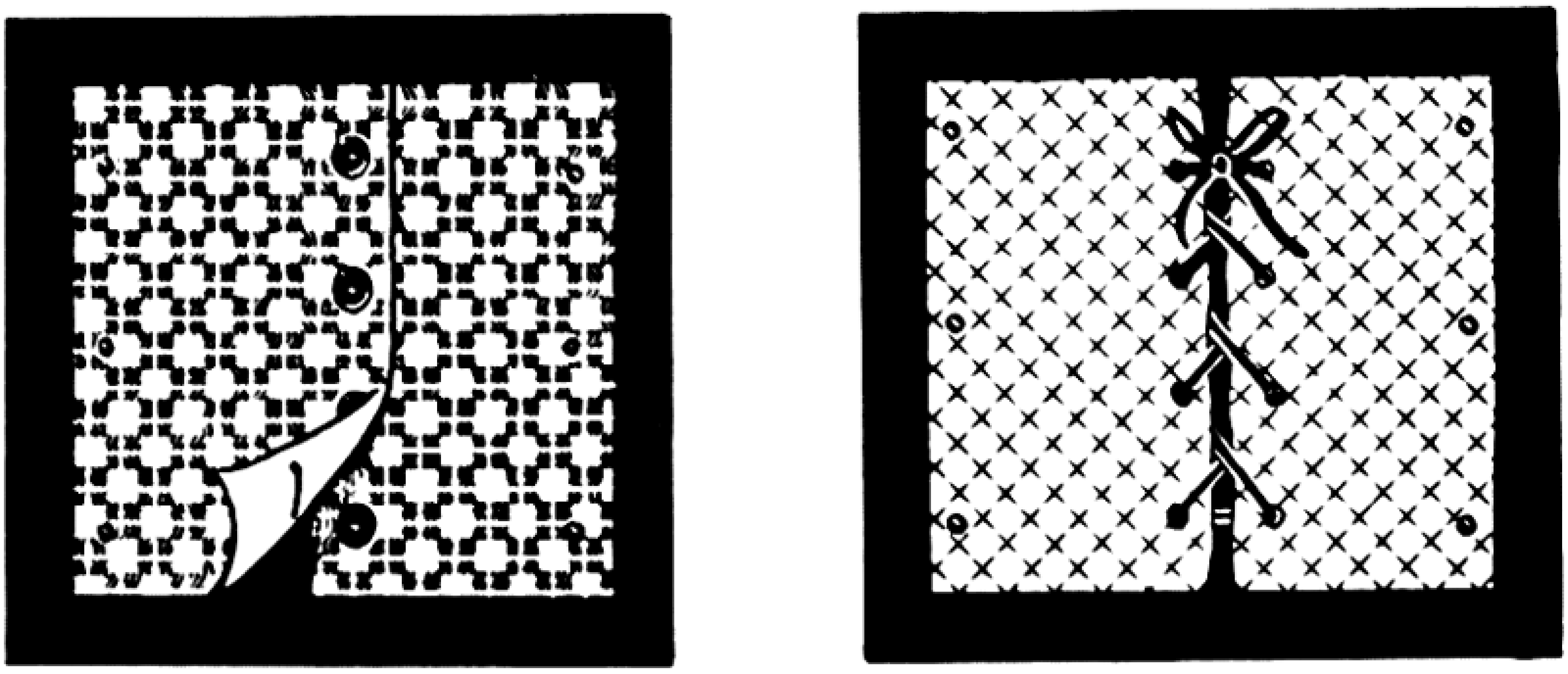

DIAGRAM 5 Training boards for teaching buttoning and lacing

OCCUPATIONAL AIDS

Many and various are the special aids devised by ingenious parents and teachers to help individual children. To some of these reference has already been made in the foregoing text. Others are:

(*a*) book-rests for children who cannot hold a book;

(*b*) sloping boards on which paper can be clipped for writing, drawing or painting;

(*c*) built-up grips on pencils and brushes;

(*d*) peg boards used for sorting colours or numbers;

(*e*) six- or seven-inch poles about an inch in diameter and having one end slit to admit a piece of cardboard with a letter, word, sentence or number on it (for use in reading or number);

(*f*) blocks of varying size and thickness to teach word or sentence building, word or sentence matching, completion of sentences, tables and simple number;

(*g*) steel boards with magnetised letter or number blocks which cannot be knocked off by the jerky movements of the athetoid;

(*h*) simple jigsaw puzzles and coloured sets of square or round boxes fitting into one another—play with these helps to develop the child's sense of spatial relations;

(*i*) special 'sight-saving' books with large print for children whose sight is defective;

(*j*) alphabet boards of various kinds, some of which can be used by the child to spell out words or sentences or numbers, by running the little squares along a central rail and so off at the sides to make room for the squares required.

One board which is particularly useful for badly handicapped children with severe speech disabilities is described thus by Margaret Fraser,[1] 'It consists of a white board, about three feet by two feet, with the letters of the alphabet painted clearly and widely spaced. The child spells by pointing to the letters and so can dictate such vital things as letters home. The board can also be used when one of the staff fails to understand a word in conversation with the child—a situation to be avoided at all cost.'

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[1] Westerlea School by Margaret T. Fraser, *The Spastics Quarterly*, Vol. 1, No. 3, September 1952. The British Council for the Welfare of Spastics

CHAPTER XIX

PARENT COUNSELLING

PERHAPS the most difficult task connected with the welfare of cerebral palsied children is that of parent counselling. Once the child has been examined by the medical and psychological members of the Centre it is advisable that the parent be given some indication of the results of the interview and the suggested type of education and treatment most likely to benefit the child.

TREATMENT

The day is rapidly passing when the doctor expects blind obedience by a parent in the carrying out of treatment which he does not understand. Nowadays most doctors briefly explain the basis and need for treatment and encourage the co-operation of the parent in an intelligent effort to follow the required schedule. On occasion the parent, who is in daily contact with his child's individual problem, suggests special adaptations of apparatus which the doctor is glad to discuss. It should be realised, however, that all such ideas should first be submitted to the specialist before any alterations are made by the parent in the use of prescribed braces, splints, etc. Moreover, care should be taken that directions from the medical and therapy staff are strictly followed. This applies particularly where parents are asked not to allow children to walk until a correct pattern of movement has been built up under supervision in the treatment centre.

The intelligent parent, working under the guidance of the therapists can do a great deal to establish and strengthen correct movement by continuing exercises at home. This is especially necessary if children are not attending a school or centre where therapy is given daily.

If a mother is planning to help the child with his exercises she should try to reproduce at home the quiet, restful atmosphere, free from tension, that she has observed in the treatment room. The best way to do this is to have a set time or times each day for treatment. The mother should not try to squeeze exercises in between two other jobs in a hurried 'get it over' attitude, as it would be better not to do them at all under those circumstances. If the mother is quiet, relaxed and soft-voiced the atmosphere is conducive to a feeling of relaxation in the child, and this is the basis of all work with cerebral palsied children.

To be able to relax, the child needs to feel secure, and so it is advisable to let him lie on the floor or on a wide table to do his exercises, which should be done rhythmically. It is unwise to continue exercises till the child is tired.

Parents are usually most anxious about the child's ability to walk but actually the order of importance from the point of view of the child's future is: facility in speech, use of hands, use of legs.

EDUCATIONAL PROGNOSIS

As has been shown in earlier chapters, a psychologist experienced in testing and observing cerebral palsied children is usually able to form a fairly reasonable estimate of the child's level of intelligence and his chances of benefiting from educational opportunities of varying types. With the very young and the very severely handicapped it is often impossible to do this and in such cases, although prediction is rash, we should try to give the child a chance to learn if there seems any possibility of his benefiting from special education.

When the prognosis is good the problem of the child's education resolves itself into arranging for attendance at the type of school suitable, if one is available.

When the child is unquestionably of low intelligence the unpleasant duty of explanation devolves upon the psychologist. The task is a delicate one requiring a good deal of tact and understanding. It is one, however, which should be squarely faced for the sake of the child and his family.

I have interviewed the parents of some eight hundred cerebral palsied children and in almost every case I have found that parents preferred to be told the truth about their child. Eventually they despise the person who talks humbug about 'growing out' of what is obviously a lack of intelligence. Moreover, the parent usually realises that his child is mentally below normal and has more confidence in the psychologist who is honest about his findings. On the other hand, a blunt statement of the condition can cause deep distress and antipathy. Hence it is worth while for the psychologist to approach the discussion with care and insight.

The method I have found most helpful over the past seven years is to discuss the child's abilities in the light of those of other children. If, for instance, the parents agree that Tommy aged ten years can just accomplish the same things as his brother aged six, it is not difficult to convince them that Tommy will be unlikely to benefit from schooling of an academic nature and so efforts should be concentrated on training him in self-help and perhaps some simple mechanical job within the limits of his handicap.

The parents' greatest concern is for the child's future. They can face this best if their professional advisers explain the true facts of the case.

PARENTAL ATTITUDE TOWARDS DISABILITY

The attitude of the parent towards his child's disability is most important in its effect on the child's future progress. If parents have a child who contracts poliomyelitis or meningitis they accept the burden without any feelings of shame, self-accusation or recrimination. Yet it is a strange truth that among parents of cerebral palsied children such feelings are common.

A sense of guilt for some act of omission or commission, possibly before marriage, is often reported; many a parent looks to place the 'blame' on something in the life of his spouse or her family; until recently the afflicted child was often hidden away because families were ashamed to admit his existence.

The psychologist can do much towards relieving the strain on the family by explaining that such ideas are completely without foundation and only lead to an unnecessary disruption in family relations. A child quickly senses emotional disharmony in the home, and if intelligent is likely to become morose and unhappy as he realises that he is the cause of the trouble. For this reason too it is advisable to discuss matters pertaining to the child only in his absence.

Sometimes parents indulge in excessive self-pity or pity for the child. In both cases the effect on the child is unfortunate and saps energies badly needed to overcome his disabilities.

Today, since more publicity has been given to the problems of cerebral palsy, families are less likely to hide the handicapped child away, but often, even now, he is not treated as would be a normal child who has had an accident. Both the child and his family must learn to accept him as he is and to face the world courageously. If the cerebral palsied child is of very low-grade intelligence it is probably better for all concerned to send him to a suitable institution for custodial care. In this way the remainder of the family can lead a more normal life, while the child is quite happy so long as his physical needs are satisfied. If satisfactory custodial care is available most parents are willing to send their child to such an institution, but occasionally parents refuse to part with their child, sometimes because ignorant neighbours disapprove.

If the child is normally intelligent or merely dull, then it is the family's duty to treat him as nearly as possible like the other members of the family. To do this poses some difficult but not insurmountable problems. The answer appears to be in discipline—discipline of the child and of his family. A cerebral palsied child who has been spoilt and pampered is likely to become a tyrant in adolescence when he realises the further frustration of adolescent urges to adventure outside the home and with the opposite sex. But if the period of childhood has been wisely used to develop to the full the abilities he has, if he has learnt to accept his disability and redirect his instincts to attainable goals, then he can still remain an acceptable and loved member of the household.

But the other members of the family too need discipline, each in his own particular way. Co-operation between members of the family is essential if the wheels of the household are to run smoothly and there will be definite responsibilities for everyone. A settled routine is of real assistance here. Father or an older sister or brother can relieve the mother of some duties so that she can spend some time with the younger children, who must not be neglected on account of the cerebral palsied child if jealousy and antagonism are to be avoided. Most children are sympathetic and indulgent towards their handicapped sibling but they should not be pressed too far. Furthermore, opportunities should be provided for father and mother to go out together sometimes.

The Adolescent

Probably the most trying period is when the cerebral palsied child and/or his siblings reach adolescence. During this period of development most people become ultra-sensitive to the opinions of others and desire to appear normal and attractive. Not only does the handicapped adolescent frequently become frustrated and aggressive but his brothers and sisters grow to resent his presence if it is in any way detrimental to their own interests. Some adolescents refuse to bring friends to the home where there is a cerebral palsied sibling and this creates further difficulties.

A possible partial solution to this particular problem may be for the parent to have a general talk about cerebral palsy with the friends, not apologising for his child but explaining that the condition is much like any other condition, such as rheumatism or weak heart. If the visitor is made to understand that the cerebral palsied child is not to be specially considered at every turn he will learn to accept him as he would any other member of the family. It is often because the visitor feels embarrassed and does not know how to treat the afflicted person that he refrains from calling. Of course the presence in a family of any sick, handicapped or eccentric person limits to some extent the circle of callers but this applies to almost every household at some period, the limiting factor being perhaps as commonplace as a new baby or an elderly relative.

What is important is for the cerebral palsied child or adolescent also to have a friend or friends who can spend considerable time with him. Then he does not begrudge his brother his friendships, particularly if opportunities are made for outings to a centre or other place where other disabled adolescents meet and discuss common interests. This does not imply that the disabled should be segregated. When the children are young it is usual to find the unhandicapped willing to spend some of his leisure with his less fortunate brother. If this spirit is encouraged it can be a great boon when the adolescent period arrives, particularly where the family as a whole enjoys some pastime. It is surprising to see the way in which games played by the whole family will be continued with avidity when the adults have to depart. Moreover, in these days when ownership of cars is common it is usually possible to arrange for family outings to the beach or the hills.

If the handicapped adolescent, reared in the love and security of a disciplined home, has been led to accept his disability, he will appreciate the opportunities for sharing leisure pursuits with his family and friends, particularly at weekends. He will then be more content with the rather restricted social intercourse available to him during the week, whether at some place of education or work, or by attendance at a special club or centre.

There is no easy road to success with the cerebral palsied and the adolescent problem has no facile solution, but it is worse than useless to sit back and expect the youth to resign himself to doing nothing all day at home. As yet the organisation for adolescents and adults is very limited, but even a weekly or bi-weekly visit to a centre can do something to alleviate tension in the home and produce in the cerebral palsied a better attitude towards life.

With the approach of adolescence the young cerebral palsied have two further problems that must be solved as effectively as possible to maintain the mental health of the adolescent himself and of his family.

Sex

First, there is the question of the child's sex life, which demands attention at this period. The natural instinctive urges producing strange feelings of excitement or depression are apt to puzzle the child who is left to brood. It is now that he realises the implications of his handicap in terms of social intercourse, particularly with the opposite sex. If left a great deal alone during this period of emotional stress he may indulge in masturbation, which in turn is likely to produce feelings of disgust and shame and perhaps fear of its disastrous effects on his health. This is a delicate situation for a parent to handle. The whole subject should be discussed freely with the adolescent, not in a tone of censure but as a straightforward statement of facts. On no account should the adolescent be threatened, for example by saying, quite falsely, that some form of illness will follow self-indulgence. On the other hand it is important that a habit should not be formed, and if the parent feels he is not capable of handling the situation he should consult a doctor or psychologist.

Sublimation. Where a child has been encouraged to develop intense interest in some hobby he will now find an outlet for much of the pent-up energy which would normally expend itself in the group games and other activities of the adolescent. The creative urge may find satisfactory expression in some form of art—drawing, painting, music, writing, needlework or some other kind of craftwork. This may take an executive or practical form or it may be of an appreciative type.

Some adolescents find joy and considerable consolation in the advocacy of a special cause which requires concentration and purpose, for this is the period during which ideals are followed with intensity and philosophies of life are formed. When such occupations can be developed in the company of members of the opposite sex a further advantage is gained.

The second problem at this stage is the vital one of deciding on a vocation.

Choosing a Vocation

Choosing a vocation is usually a trying and difficult task even for the intelligent adolescent who has normal physical equipment. The percentage of people who reach adolescence sure of what vocation they will follow is very small indeed. In most cases the adolescent looks for guidance and advice to his parents and possibly his teacher or some other responsible person. The wise parent gives all the relevant information at his disposal and then leaves the boy or girl to make his or her own decision, for then the adolescent feels the responsibility of his freedom of choice and the need to justify his decision. If coercion is used the adolescent may unconsciously take refuge from the difficulties he is sure to encounter at some stage by lapsing into an unfavourable attitude to the work because his parents forced or persuaded him into it.

In choosing a vocation several aspects of the question should be considered.

Personal Preference. The most important quality of the vocation chosen should be that it appeals to the adolescent as a life-long occupation. If he is happy doing a particular type of work then he will overcome many of the obstacles invariably encountered in the daily routine. In this connection it is necessary to explain, as well as possible, what various jobs entail as regards responsibility, duties, conditions, psychological factors involved, etc.

Mental Ability and Education. The second factor to be considered is whether the boy or girl has the mental ability and education necessary to be successful in a given post, and whether he or she is psychologically equipped to fill it efficiently.

Physical Fitness. The element of physical fitness for any particular vocation is one which looms large in the discussions of training cerebral palsied children. Generally speaking the *slightly disabled* can follow almost any calling for which they are otherwise fitted, although tasks requiring normal strength of endurance may be out of the question for them. Then, also, a boy with one limb badly disabled would be limited in certain directions. But generally for this group the scope of choice is considerable.

For the more seriously handicapped the field is narrowed to those kinds of work which do not depend on the use of the disabled limbs. Children whose handicap is confined to the legs may be trained in many sedentary tasks such as watch repairing, optical or dental mechanics, developing and printing films, clerical work, statistical and research work, assembling parts of small machinery or equipment, art (including industrial art) pottery, cane work, etc. Although the inability to move about normally will be a handicap in these vocations it is not insurmountable. The chief obstacle is getting to and from the place of employment and for this reason it is preferable if a post is a residential one. If this is not possible then it is desirable to find work as near home as possible; car transport can sometimes be arranged by another member of the family or a neighbour, or by the cerebral palsied himself.

To the cerebral palsied who have severe hand disabilities fewer opportunities of employment are available and it is for this reason that therapeutic treatment for hand co-ordination takes precedence over treatment for the legs. Except in very severe cases, however, it is usual for the child to be able to use one hand to some degree and every effort should be made to bring hand-co-ordination to the highest possible level.

In those very severe cases which will be confined to the home it is wise, where possible, to have them taught a good craft such as dressmaking (using an electric machine), millinery, embroidery, woodwork, metal work, leather work, book-binding, weaving, etc. Although the receipts from the sale of the finished products will probably be considerably less than a person would earn in outside employment, it is important to organise a regular business, however small, so that the worker will have not only the joy of completing his work but also the satisfaction of knowing he is contributing, at least in part, to his personal expenses.

MARRIAGE

From the material discussed in previous chapters, it will be apparent that cerebral palsy is not, except in rare cases, hereditary and that it carries no stigma. Hence there is no reason why cerebral palsied adults should not marry provided they are materially and psychologically capable of providing a satisfactory home for their children. In fact, many marriages where either one or both partners are cerebral palsied are quite successful. When, however, the disability is very pronounced, the cerebral palsied parents may not be able to give their children a happy, secure childhood.

In all cases it is for the participants themselves to judge whether or not they shall marry. As illustrative of what courage and determination can do for handicapped people I quote a case which came before our Brisbane Clinic recently. Mrs X., aged thirty-eight, has been very severely disabled since birth. She is unable to walk and her left hand is badly handicapped. Her speech, though indistinct, is intelligible. It is apparent at first contact that she is an intelligent woman whose character and personality have triumphed over her physical limitations. When she was nine years old her mother died, leaving the father with five children of whom our patient was the eldest. Consequently, in spite of her handicap, she assumed the responsibility of caring for the little ones until arrangements were made for placing them. Our patient, with the youngest sister, was sent to a foster home where they remained until the elder girl was fourteen, when she returned to make a home for her father. At the age of twenty-seven she was married, shortly after her father's death, and she now has two sons aged five and six years. She does her own housework, laundry, cooking, sewing, etc., moving about in her wheel chair. With a bright smile and quiet confidence she explained to me, 'If you have the will power to do a thing you can do it.'

CHAPTER XX

FUTURE DEVELOPMENTS

RECOGNITION OF THE PROBLEM

THE last fifteen years have seen a gradual realisation of the problem of cerebral palsy with its many facets, each demanding specialised knowledge and intensive study by a variety of research workers. From being a neglected section of the community the cerebral palsied have now become a group recognised as worthy of consideration from many angles. Whereas in the first place, apart from a few interested pioneers, the champions of the cerebral palsied were mostly parents of these handicapped children or members of Crippled Children's Societies, today the general public is sympathetic and usually generously disposed towards the welfare of cerebral palsied children.

In America, Australia and Britain, and to some extent in other countries, facilities have been provided for the education of an appreciable proportion of these handicapped children. This provision, at first initiated by voluntary contributions, is gradually becoming the obligation of state education departments all over the world. But as yet attention has been concentrated largely on the education of the intelligent cerebral palsied child at the primary and nursery school (kindergarten) level. This only touches the fringe of the project. There are a number of related problems which we shall have to face in the near future.

SECONDARY EDUCATION FOR THE INTELLIGENT CEREBRAL PALSIED

With the provision of educational facilities for badly handicapped cerebral palsied children it is to be expected that we shall shortly have a proportion of children who will need some form of secondary education up to the age of at least fifteen or sixteen years. It seems likely that in any particular community the numbers who will require further education beyond that age to enable them to qualify for entrance to a university will be very small, and if these children cannot be given tuition in the ordinary secondary school then individual tuition along the lines of the supervised study type appears to be the only solution. This is being done for a few children in some schools for spastics.

At the same time the majority of the children attending these special schools will require some kind of vocational training during the latter years of their school life, and it is in this direction that we shall need to plan for the future. Some American schools for physically handicapped children have excellent provision for training children in vocations suitable for the disabled.

Some children whose disability is confined to the legs may be able to learn secretarial work. Most girls will find useful a course in domestic science and mothercraft, while boys will be equally keen to learn woodwork and allied subjects. It is perhaps even more important for handicapped than for normal children to be given instruction in these subjects. In the Brisbane Spastic Centre a start in this direction has been made by provision for some of the older girls to attend the weekly home science classes at a neighbouring school.

It is comparatively easy to satisfy the cerebral palsied child when he is young, but as he approaches adolescence he becomes acutely aware of his deficiencies and of his difference from others. If his education and training have been neglected he may become morbid and dissatisfied when he realises that he cannot fit into society. On the other hand, there are numerous examples of quite severely handicapped cerebral palsied adolescents who with suitable education and training have become successful doctors, lawyers, artists,[1] accountants, skilled craftsmen,[2] manual labourers and so on.[3] Some of these encountered during the research testified to the wisdom of providing vocational training for those adolescents who can profit therefrom.

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[1] During my recent visit to New York a one-man exhibition of art was being held by a severely handicapped former pupil of Carlson's school.

[2] In a recent visit to the A. Harry Moore School for Physically Handicapped Children in Jersey City, U.S.A., I found educational facilities provided for cerebral palsied children to follow professional, commercial and technical courses. Some children who could not walk but who had good

PROVISION FOR CHILDREN OF LOW INTELLIGENCE

Up to the present time workers for cerebral palsied children have concentrated their efforts almost exclusively on the provision of education for the intelligent handicapped child. And, in my opinion, rightly so, for we have had to prove to adverse critics that these children are worthy of greater consideration than was formerly given them. But, having established their claim, we now need to consider the cerebral palsied *child of subnormal intelligence*, for whom little provision has been made in any country. Future efforts for these children might take three directions—the provision of day or residential Occupation or Training Centres for the high-grade defective, social or play groups for those of still lower intelligence and residential institutions for those in need of permanent custody.

In some areas, for example in Birmingham (England) and Brisbane (Australia), parent bodies in certain neighbourhoods have arranged for small groups of children to be brought each day to a house or hall where they are supervised by the mothers on a roster basis. In this way all mothers get some days free of the responsibility of their disabled child.

Moreover, these groups bring together children and parents in the same area and so often provide the opportunity for the establishment of friendships between children and/or parents who, carrying similar burdens, have a common basis of understanding and appreciation on which to build. When they visit one another's homes the handicapped child can be taken along without any fear of tension arising, and this in itself is a boon to the parent of the cerebral palsied child, while the handicapped children can play together without the feeling of inferiority which normal children sometimes engender in the minds of their less fortunate playmates.

hand co-ordination were being trained as mechanics in the dental and optical industries.

[3] See The Cerebral Palsied Child Goes to School by Winthrop M. Phelps and Arthur Turner, *Hygeia*, April and May 1948.

In cities it would seem advisable to establish a larger centre for children who are subnormal but trainable. Here therapy of suitable kinds could be given to those who are able to profit from it, while teachers experienced in handling this type of child could help them to develop whatever ability they have, and could train them in self-help and social adaptability as far as is possible.

As it is highly unlikely that most of these children will ever be able to acquire any useful standard in the basic subjects it would seem more profitable to spend the available time on activities which will bear fruit in the children's future lives. It is, I consider, a complete waste of time and wholly artificial to try to force such children through even a modified syllabus of the work of the normally intelligent pupil. Even if the child manages to read a few words or to copy sundry letters and numbers, these will be forgotten soon after he leaves the classroom. What a waste of precious time for a child already so badly handicapped! Would it not be better to let the child spend that time in happy enjoyment of practical or leisure time activities such as handwork, sewing, music, stories, drawing, gardening, home duties and, where possible, manual training? It has been conclusively proved that these activities, in addition to helping these children to master certain skills and improve their powers of co-ordination, make a most important contribution towards their social training. They learn to play and work with others, they learn to obey commands and follow instructions, they learn to accept and profit from the guidance of their teachers and parents. For the few in this group who can benefit from lessons in reading and simple arithmetic individual instruction would give the best results, and this could be given while the other children were engaged in painting or handwork.

CHILDREN OF VERY LOW INTELLIGENCE

In my experience accommodation is urgently needed for children of very low grade intelligence, who are best provided for in a residential establishment. Most countries have certain institutions which take a proportion of these children, but this is a form of provision about which there may need to be reconsideration in many parts of the world. It would appear reasonable that this is a task which should be undertaken by the appropriate state health authorities, for the whole problem is one involving the mental health not only of the patient but also of the patient's family. It is not easy to assess the detrimental effect that the presence of a low-grade defective child has on the family circle, and today, when the community is concerned about the instability of family life towards which mental disharmony and child delinquency are not infrequently important contributants, the establishment of adequate institutions for the care of the low-grade defective would be a step towards alleviating tension in at least some of the more depressing situations.

PARENT ASSOCIATIONS

Wherever work with cerebral palsied children has proceeded strong parent bodies have been behind the movement. This is both natural and desirable, and while impartial observers today agree that the state should be responsible for the welfare of the cerebral palsied child, no thinking person would wish to have the parents absolved from responsibility for their child, nor would most parents desire this. People tend to place greater value on something for which they have had to work and sacrifice than on something which is obtained without effort. And this is one reason why parents of cerebral palsied children should be encouraged to contribute towards the running of the centres.

But the advantages to the parents of belonging to the Parent Association far outweigh any obligations entailed. Parents who were formerly depressed to the point of despair have found in these associations others whose burden is even heavier. They have been helped by the interchange of ideas and suggestions on the management of their children and the organisation of their home routines.[1] Those who felt themselves shunned because of their handicapped child have been helped to reorientate their attitude towards society.

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[1] In this connection it is of value to have a Parents' Magazine where questions of vital interest to members are discussed. Such a magazine, *Parents' Circle*, first published in October 1948 by the Midland Spastic Association (Birmingham), later developed into *The Spastics' Quarterly*, the

Lectures and the showing of films[1] by specialists in the various branches of therapy and education have enabled parents to understand the general problem of cerebral palsy and to evaluate the efforts being made on behalf of their children. By this means also parents can observe what is being done at other centres and can obtain suggestions for equipment and apparatus.

Lectures and films serve the further purpose of educating the public with respect to the possibilities and welfare of the cerebral palsied. In the past it has been found that the public has been most generous in its support of this work; particularly is this so in Australia where the Spastic Centres stand as wonderful monuments to the big-heartedness of a young and sympathetic nation.

HANDICAPPED ADOLESCENTS AND ADULTS

For the handicapped adolescent and adult who have passed beyond the scope of the schoolroom certain provision is made in most countries for vocational training and hence a proportion of the disabled cerebral palsied are absorbed into the training centres and finally into jobs of varying types. These training centres are doing such good work in the community that it is a pity their scope is not more extensive and comprehensive, so that more deserving cerebral palsied cases could benefit from training.

The 1948-52 *Report*[2] of the British Council for the Welfare of Spastics states: 'The Council is also seriously concerned at the complete lack of specialised residential accommodation where severely handicapped adolescent and adult spastics of average intelligence can receive treatment and training in such residual

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National Magazine for Cerebral Palsy, published by the British Council for the Welfare of Spastics.

[1] I am indebted to Mr Paul Cadbury for sending me a copy of the film *The Children of Carlson House*, which I have shown after lecturing on cerebral palsied children to large audiences in the capital cities of Australia. The film has thus proved of intense interest and value to many hundreds of parents and welfare workers.

[2] *The British Council for the Welfare of Spastics*, *Report* 1948-52, p. 1

skills as they may have or be able to develop.' An example of the kind of place needed to meet this demand is Puckle Hill House in Kent, which now undertakes the training of thirty boarders aged from fourteen to nineteen years who gain experience in poultry keeping, gardening, domestic science and handicrafts.

In Australia the organisation set up for the rehabilitation of ex-service men is now being used for disabled civilians and some cerebral palsied are helped in this way. Whether such provision will be sufficiently comprehensive to deal with the cerebral palsied adolescents and adults needing training is still uncertain.

Complementary to the training of the handicapped adolescent is the question of employment, and here the co-operation of the public is essential. Sheltered workshops may be a solution for some of the more handicapped but some disabled men and women are capable of employment alongside their normal fellows if certain allowances are made for modified results from their labours. This is a small price for a successful business man to pay for the joy and satisfaction of the wage-earner, who can thus feel independent or partially so. Moreover, many handicapped adults can do good work in selected tasks if consideration is extended to them in their disablement, for example, if they are allowed to sit at their work, or are not required to maintain a speed of accomplishment beyond their powers.

CAMPS AND CLUBS

Work with the cerebral palsied has now progressed to the point where those interested in their welfare endeavour to enrich their lives as much as possible. For this reason Spastic Centres have established Girl Guide and Boy Scout groups which carry out normal routine as far as possible. Holidays at hostels or camps are also a feature of many centres, public support for such occasions being most generously given. In these assignments the Social Worker of the centre is usually vitally concerned and on her depends in large measure the success of the venture.

CEREBRAL PALSIED ADULTS

Throughout this book emphasis has been placed on the education and treatment of cerebral palsied children, for it was in this field that the first steps in research had necessarily to come, but research and provision for the handicapped children are of limited value unless we then follow up with adequate facilities for the handicapped adults to live and work as far as possible like normal citizens. This should be our goal, though perhaps as yet it is some distance off.

Every parent of a handicapped child freely admits that her greatest concern is for her child's welfare when she herself is no longer there to care for him. What becomes of these children or adults when their parents die? Those of very low intelligence may find their way into a public institution, but what of the intelligent ones, many of whom could help to support themselves and all of whom will suffer from institutional life away from their own kind?

A possible solution to this difficult problem might be the establishment of a hostel where handicapped adults could live, and towards the upkeep of which they could pay according to their means. Here they would have the companionship of others similarly afflicted, and mutual understanding would give a basis for friendship and co-operation in whatever ventures were possible. The exact pattern of such a scheme would emerge as the project developed. Only then could it be decided whether to have separate hostels for those going out to work or whether these more fortunate members could find some compensation in helping to brighten the lives of their more handicapped fellows by living side by side with them, sharing their simple joys and helping them over their many problems.

RESEARCH

To date there have been very few investigations into the psychological and educational problems of cerebral palsied children, yet research is vital if progress is to be made in this field of special education. Most spastic centres now keep records of the children admitted and these should furnish excellent material on which to base investigations of developmental rates in various mental and scholastic abilities. There is a need for cumulative studies of cerebral palsied children of varying physical, intellectual and temperamental qualities over five to ten year periods, in order, firstly, to indicate the nature and the extent of progress made by different groups, and secondly, to provide an evaluation of the effects of treatment and educational methods. Statistical analysis of the different progress made by various groups in respect of age, intelligence and form of disability would provide some guidance on future educational and psychological programmes.

Then there is a need for research into the field of personality testing. To date there has been negligible use of any form of projection tests with the cerebral palsied, yet results from tests such as the Rorschach, the Thematic Apperception Test, the Rosenzweig Picture-Frustration Test, other picture tests, and story-telling tests could provide most useful information on which to base therapy and social training.

Because problems of personality development and social training loom large in the psychological guidance and education of cerebral palsied children it would be advantageous to those working in the field if research workers could provide some information on (*a*) the value of psycho-therapy for cerebral palsied children and (*b*) the relative value of different forms of social training for which experiments could be devised and results evaluated by analysis of variance techniques. It would also be very valuable to psychologists and teachers to have a really effective social maturity scale, for, as I have indicated earlier, the Vineland Scale is far too heavily weighted with items involving physical maturity—a questionable weighting even for normal children and a bias which limits greatly its use with cerebral palsied children. In this area, too, workers would benefit by a study of the attitudes, wishes and interests of cerebral palsied children of various ages. In fact the mental life of grossly handicapped cerebral palsied children presents a wealth of fascinating material which awaits study. Obviously this field would lend itself admirably to a study of the Piaget type, and no doubt some of the results obtained from children with limited physical powers and much curtailed experiential opportunities could throw light on facets of the development of normal children.

There is also insufficient information on the continued use of certain forms of intelligence tests with these children. A careful analysis of the scatter of items passed and failed, when individual tests like the Terman Merrill and Wechsler-Bellevue are used with representative age-group samples of cerebral palsied children, could yield interesting data.

Above all, there is the most urgent need for experimental work in the classroom with methods and equipment for teaching cerebral palsied children. Some of these experiments could be initiated by trained teachers while others might be directed by research workers within a University Department of Education. In fact one of the most fruitful ways of promoting research as a whole into the education and guidance of cerebral palsied children would be to link up a relatively large Spastic Centre with a University Education Department. Examples of the work done at Manchester University for deaf children and in the University of Birmingham and the University of Queensland for backward children lend support to this contention.

But in spite of the persistent problems that face us for future solution we can derive inspiration and encouragement from the amazing progress of a single decade, for it should be remembered that almost all the educational and psychological help for cerebral palsied children and adolescents dates from 1940—much of it from 1945.

In this short time workers have demonstrated to the world that all cerebral palsied children are not unintelligent—at least half of them have sufficient intellectual power to merit help—and as a result many deserving handicapped children have been given a banner of hope to bear along the highway of successful and happy educational progress. And not only has hope entered the minds of the cerebral palsied themselves but help has also brought relief from frustration and despair to the mothers and fathers and normal sisters and brothers in many hundreds of homes. In this way stability of family life has been restored and protected, and insofar as the mental health of a nation is simply a reflection of the mental health of its individual families, so provision for the cerebral palsied is making a contribution to the mental health of many citizens. This new field of humanitarian service, as important for the community as for the individual and his family, is a fine tribute to the social spirit of the twentieth century.

APPENDIX A

MIDLAND SPASTIC ASSOCIATION

CEREBRAL PALSY RECORD

Name of child:	Date of examination:
Date of birth:	Sex:
Address:	Age:
Place of examination:	Local Authority:

Location	Under 5	5-15	16-18
A. At home			
(i) At home—under school age			
(ii) Attending ordinary school			
(iii) Attending day special school:			
Physically handicapped			
Delicate			
Educationally sub-normal			
Other			
(iv) Receiving education at home:			
Under Local Education Authority			
Otherwise			
(v) Referred to Local Mental Deficiency Authority			
(vi) At home—over school age			
B. At Boarding Institutions			
(i) Boarding Special School:			
Physically handicapped			
Delicate			
Educationally sub-normal			
Other			
(ii) Hospital or hospital school			
(iii) Mentally Deficients Institution			
(iv) Other Institution (specify, e.g., Public Assistance, Voluntary home, etc.)			
C. Awaiting Attention under A (i) to (v) or B (i) to (iv), (Specify)			

Present Condition:

Athetosis.
Spastic palsy.
Cerebellar ataxia.
Tremor.
Epilepsy.
Convulsions.

Upper limbs, R. & L.
Lower limbs, R. & L.

Function: Upper limb(s) Palsy—Slight.
,, Moderate.
,, Severe.
Can fasten/unfasten buttons easily.
Can fasten/unfasten buttons with difficulty.
Quite unable to fasten/unfasten buttons.
Able to feed himself.

Lower limb(s) Palsy—Slight.
,, Moderate.
,, Severe.
Can walk without assistance.
Can walk with assistance.
Can walk with apparatus.
Not able to walk.
Not able to stand.
Gait—Normal.
Slight stiffness.
Marked scissor

Head: Circumference of

Other deformities: Spine Feet Others

Speech:	Normal.	Sl. defective.	V. defective.	None.
Sight:	Normal.	Impaired.	Blind.	Squint.
Hearing:	Normal.	Impaired.	Deaf.	

Continence: **Bladder.** **Bowels**

Normal control.
Occasional incontinence.
Frequent incontinence.
No control.

Intelligence: Idiot.
Imbecile.
Ineducable.
Not yet assessable.
I.Q. (if possible).

Educationally sub-normal.
Average.
Above average.

Aetiology: Age at which recognised:

Ante-natal:	Rh. factor. Familial. Rubella. Toxaemia of pregnancy. Syphilis.
Natal:	Prematurity. Birth injury or asphyxia. Birth weight.
Post-natal:	Trauma. Infection.

Educational attainments:
Reading age.
Arithmetic age.
Able to write well.
Can just write.
Unable to write at all.

Other tests.

Emotionality:
Average.
Slight lack of control.
Marked lack of control.

Home conditions:	Good.	Average.	Poor.
Parental care:	Good.	Average.	Poor.

Other physical conditions not associated with spasticity:

Health of parents and family history:

Signature..

(This form should be completed in duplicate, the second copy being sent in due course to the British Council for the Welfare of Spastics for central recording).

APPENDIX B

Magazine produced by pupils at Carlson House School for Spastics

'CARLSON HOUSE CLARION'

March 1954 Volume 2 Number 10 *Editor*: JOHN LYNES

Editorial

Well folks, you may remember that in the last *Clarion* we told you that we had some special news for you, well, here it is. We are going to close down the *Clarion* because Anthony Sutton and I are studying for the G.C.E. and therefore will not have much time to work on the *Clarion*. We decided that we should close down now with a really splendid number, as we hope this one will be.

Here is some more news. We are very sorry to announce that the man who was 'in at the beginning', Mr Collins, is leaving Carlson House on March 31st. He is going to teach at a new school for spastics at Northampton. This new school needs people who are experienced in teaching spastics. We shall all miss him very much; we wish every success and good luck in anything he does and anywhere he goes.

Well, readers, I am afraid that the two big news items have been rather sad, but it cannot be helped.

We started the *Clarion* in December 1952, so we have been going for over a year.

We do sincerely hope that you have enjoyed reading the *Clarion* as much as we have enjoyed producing it.

Yours truly,
THE EDITOR

Surprise Pool

Surprise Pool has three fish now. There are two mussels and about a dozen snails. The pool has three or four plants. The water does not need changing because the air-pump keeps it fresh. We are most interested to see that the pool has still two larvae (Caddis-fly?) sleeping in their little cylinder-shaped homes. As the weather gets warmer we shall see them moving about the pool again.

Ring in the New

The fact that this is the last issue of the *Carlson House Clarion* does not mean that news of Carlson House and its activities will never appear in print again. We are pleased to hear that the Midland Spastic Association is to have its own news-sheet, edited by Miss Taylor. The Bournville Youth Club have undertaken the actual printing of the magazine, thereby adding to their many 'helping hands' given to the M.S.A.

So far a title has not been chosen for this new magazine, but doubtless the wheels of wit are turning and the brains of the M.S.A. editorial department are searching for a suitable dynamic, impressive, compelling name with which to head the hit-lines and vice versa.

So the *Carlson House Clarion* passes the torch to this new magazine, which promises to go further and do more than ever lay in the power of the modest *Clarion*. The M.S.A. will possess its own medium with which to unite its members and friends.

Miss Taylor invites anyone to send in articles, stories, reports, puzzles and especially snippets of news to interest all spastics and their friends in the Midlands.

Good Luck and much reading and writing for the new magazine!!!

Clarion History

On this last appearance of our news-sheet, we are interested to note the following facts about our little enterprise. During its life of fifteen months the *Carlson House Clarion* has contained:

over 1000 lines of print
115 articles by
over 20 contributors
(only four of these were adults)
10 advertisements
(well answered)

Over 600 copies were printed in all, some of which travelled to Australia, U.S.A., Switzerland, while many were distributed over the British Isles.

To all our readers and our writers we say 'GOOD-BYE and GOOD LUCK'. We thank you all for your support of the *Carlson House Clarion*.

Carlson House International Relations

After nearly seven years at Carlson House the pages of our Visitors Book would provide a lively Geography lesson if the homes of our many friends were located on a map. A particular welcome is extended to people from other countries who are willing to share experiences and widen our outlook.

Early in 1950 Mr Toh See King, from Singapore, spent a week with us; amongst other things he told us of his school so far away. Mr Paul Cadbury, after a visit to Moscow, brought back gifts from a kindergarten school—this forged a small but important link between the two countries. The name of Kismet Fung reminds us of a fascinating afternoon when we listened to songs from Peking. Other friends from Zurich, Bombay, Copenhagen, The Hague, etc., have given first-hand accounts of life in their home towns. Altogether we have had representatives from thirty-two countries, including these well-known places, Oslo, Vienna, Berlin, Helsinki, Athens, Johannesburg, Prague and Toronto. Our school film has travelled far afield to such cities as Paris, Brisbane, Stockholm.

This term Mr G. W. Cadbury visited us on his way from New York to Colombo, where he is now helping to provide technical assistance. His description of the wonderful work being done by United Nations made us realise how much support is needed for the whole organisation. We can do our share by forming a U.N. Branch at Carlson House to give us more understanding of world-wide problems and to strengthen the bonds of international relations.

Carlson House Stamp Club

Our stamp club has been on the go for a year now. Its twelve members receive some stamps each week. The club itself saves stamps on envelopes; any other stamps are given to members. Once again we appeal for stamps, any kind, any number. We are pleased to have Miss Rosser as President for 1954.

Competition

Name the Countries

There are twenty towns mentioned in the article in the next column, written specially for us by Miss Woodall. Can you write these towns in order and add the name of the country to each one? Test your geography with this interesting competition. Entrants must be under fifteen years of age; atlases may be used, but no other source of information. The completed list should be sent, before March 31st, to:

Miss C. Woodall,
Clarion Countries Competition,
Carlson House,
Victoria Rd, Harborne, B'ham 17

What Spastics Can Do

by John Lynes

I would like readers to know some of the things we do at school:

Gardening	Botany
Woodwork	English
Arithmetic	History
Geography	French

We also have a library.

Most of us have treatment every day. Anthony Sutton is now accomplished at typing and he has done all the typing for the *Clarion*. I am fourteen years of age and I can now walk with sticks. I can use my hands quite well. I have been at Carlson House for almost four years and like it very much. When I leave I intend to get a job and earn my living.

Carlson House Girl Guides

by Annette Jackson

The Carlson House Guides started in September last year. They were started by Miss Crow, who worked here three months. There are three guides in each patrol; patrol leaders are Barbara Richards and myself. Meetings are held each Wednesday at 5 p.m., starting with 'Patrol Time', in which we learn Guide Law, the promise and guide-craft.

Carlson House Scout Troop

by Peter Davis

Our troop meets each week on Thursday at 7 p.m. We have two patrols, the Swifts and the Kingfishers. In future the Swift patrol is to be called the Panther patrol.

Recently Skipper gave us good news. A scout was to be chosen to represent our troop at Windsor during April. John Lynes was the lucky one chosen for this important event.

GOOD FORTUNE TO ALL OUR READERS

APPENDIX C

RECORD BOOKLET FOR USE WITH CEREBRAL PALSIED CHILDREN

NAME   Date of Birth

Address

Date of Admission

Date and Details of Leaving

Previous Schools

MEDICAL DIAGNOSIS

INTELLIGENCE

Date	Class	C.A	M.A.	I.Q.	Test used	Tester	REMARKS

PHYSICAL INDEPENDENCE

Date	Feeding	Toilet	Using hands	Standing	Walking	Dressing	REMARKS

SUBJECT ATTAINMENTS

Reading

Date	Word recog.		Comprehension		Test used	Tester	REMARKS
	C.A.	R.A.	C.A.	R.A.			

English

Date	C.A.	Oral	Type	C.A.	Written	Type	Tester	REMARKS

Arithmetic

Date	C.A.	+	−	×	÷	Test used	Mech.	Prob.	REMARKS

Date	TEACHER'S REPORT

PERSONALITY

Date	Self confidence	Persistence	Emotional stability	Retentivity	Social Development	REMARKS

OUTSTANDING CHARACTERISTICS

Date PHYSIOTHERAPIST'S REPORT

Date

SPEECH THERAPIST'S REPORT

Summary of diagnosis of speech disability

Jaw

Lips

Tongue

Phonation

Breathing

Articulation

GENERAL

Place in Family

Father's Occupation

Home Conditions (Economic and Cultural)

Previous Illnesses

ATTENDANCE RECORD

Date year ending	Possible	Actual	Class	REMARKS

GRAPH OF ATTAINMENTS

	Dates									
Age										
17										
16										
15										
14										
13										
12										
11										
10										
9										
8										
7										
6										
5										
4										
3										

C.A.	Blue
M.A.	Red
R.A.	Green
A.A.	Black

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